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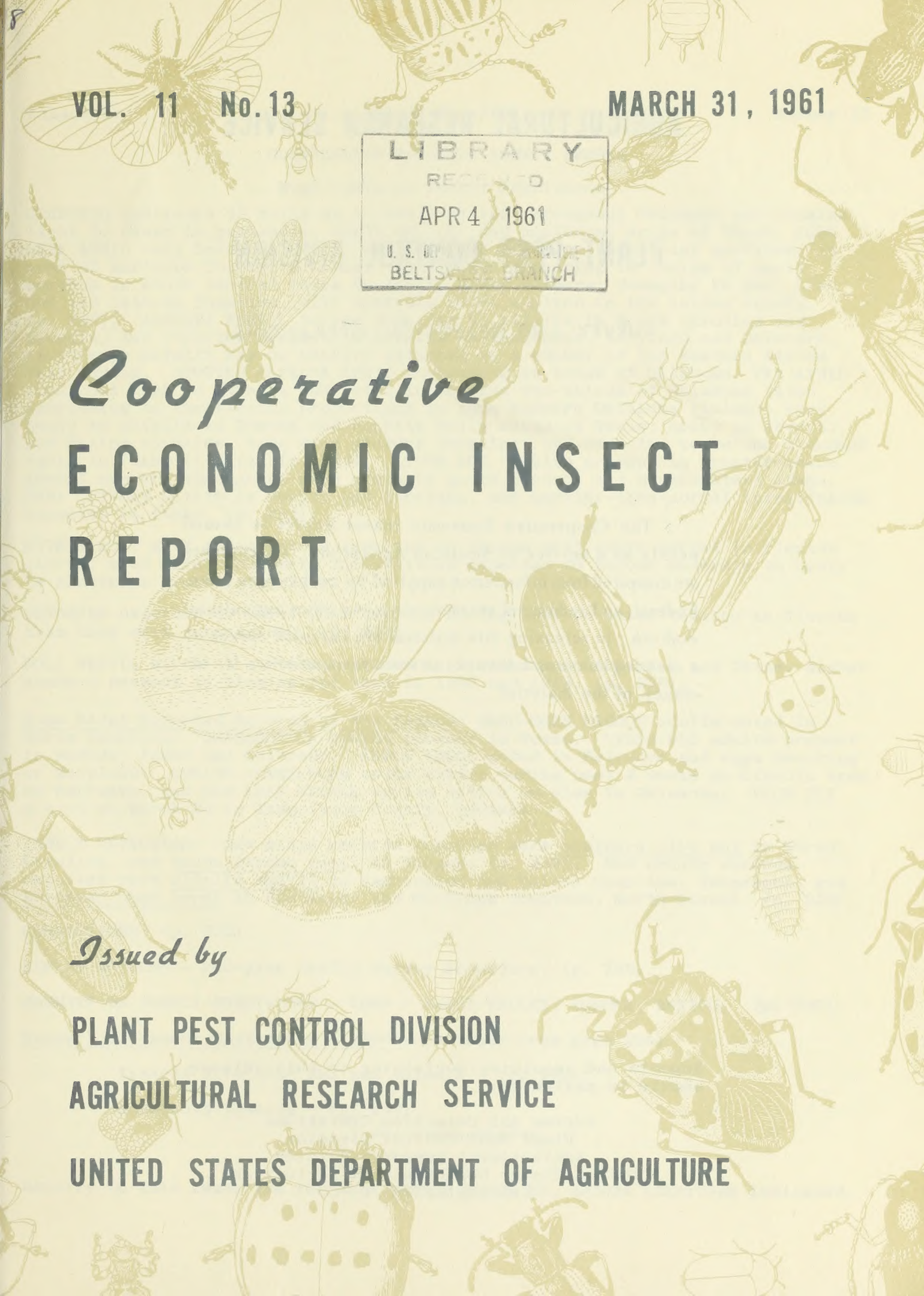

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Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
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Volume 11 March 31, 1961 Number 13

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

GREENBUG continues to build up in small grains throughout Oklahoma and remains light to heavy in panhandle, north central and northeast areas of Texas. CORN LEAF APHID very heavy on barley in Texas and heavy on barley and safflower in area of Maricopa County, Arizona. CHINCH BUG appearing in fields of small sorghum in south central Texas in fairly heavy numbers; damaging in Bee, Live Oak and Calhoun Counties, with controls being applied in the latter county. (p. 223). ALFALFA WEEVIL larvae damaging to alfalfa in South Carolina and Georgia, and reported present in alfalfa in Tennessee, Maryland and Delaware. First-crop alfalfa may be heavily attacked in a number of the Eastern States this spring. SPOTTED ALFALFA APHID increasing in areas of Oklahoma. PEA APHID continues high in alfalfa and vetch in western two-thirds of Oklahoma (also increasing to threatening proportions in some eastern Oklahoma fields); very heavy in alfalfa in Denton and Wichita Falls areas of Texas; heavy in several New Mexico counties, with many growers treating; and expected to become abundant again in Idaho alfalfa. (p. 224). LYGUS BUG adults present in greater-than-normal numbers throughout many areas in south central and southwestern Idaho. ARMY CUTWORM active in Nevada and Nebraska, and heavier-than-normal infestations expected in Idaho. (p. 225).

CITRUS RUST MITE infestations expected to become well above normal in Florida citrus; also CITRUS RED MITE infestations expected to become moderate to heavy in scattered groves. (p. 226).

CUTWORMS expected to be of more concern during 1961 on shade tobacco in Florida than they were during 1960. (p. 227).

BOLL WEEVIL survival surveys reported in Mississippi, Arkansas and Texas. Higher numbers present in Mississippi than in 1960 and 1959. (p. 228).

Some First Reported Records of the Season: SEED-CORN MAGGOT adults noted in North Carolina. GRASSHOPPER nymphs present in Texas. LYGUS BUG adults present in Nevada, Idaho and Colorado. APPLE APHID noted in Delaware and eggs hatching in Maryland. SPRING CANKERWORM moths active during past 2 weeks in Lincoln area of Nebraska, and ELM LEAF BEETLE adults active on elms in Oklahoma. FACE FLY active on March 25 in Tippecanoe County, Indiana.

INSECT DETECTION: New state records reported were southern fire ant in North Carolina, and brown garden snail in Oregon. (p. 232). New county records reported were alfalfa weevil in Washington and Unicoi Counties, Tennessee, and European corn borer in Hettinger and Billings Counties, North Dakota. (p. 224).

CORRECTIONS (p. 232).

SURVEY METHODS - Red-pine Sawfly Survey Procedure. (p. 235).

SUMMARY OF INSECT CONDITIONS - 1960 - YAQUI VALLEY, SONORA, MEXICO. (p. 240).

Summary of Insect Conditions - 1960 (continued from page 220)

Insects Affecting Man and Animals - (p. 242).

Household Insects - (p. 253).

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Reports in this issue are for week ending March 24, unless otherwise indicated.

WEATHER OF THE WEEK ENDING MARCH 27

Temperatures for the week averaged well above normal for the seventh consecutive week in the northern Great Plains and near normal elsewhere. Frequent, widespread precipitation contributed to some flooding in the Midcontinent area and kept soils too wet to work in the Pacific Northwest, the central and lower Mississippi Valley and East. The additional moisture was beneficial in some sections of the Far West, but was generally too light in the western portions of the Great Plains.

East of the Rocky Mountains, the early part of the week was unseasonably cold, particularly in the Northeast where a few subzero minima were recorded in northern New England. During the week, freezing extended southward to Oklahoma and northern portions of Alabama, Georgia and South Carolina. Rising temperatures the latter part of the week reached the 70's and 80's in the northern Great Plains, and the 50's and 60's in the upper Mississippi Valley and Great Lakes region. In Iowa, Wisconsin and Minnesota, the high temperatures caused the snow cover to melt rapidly, which resulted in flooding along many streams.

Precipitation in the Far West generally exceeded 0.50 inch of moisture in the central and northern portions of the Great Basin and northern Rockies, in the Cascades and Sierras, and in coastal areas from central California northward. This was the heaviest weekly precipitation in Montana since August 1960. Locally, weekly totals were as much as an inch in northern Utah and 0.75 inch in northern Nevada. In California, weekly totals ranged up to 1 or 2 inches in northern portions of the State, 2 or 3 inches in the Cascades and Sierras, from 0.10 to 0.35 inch in the northern portion of the Central Valley, under 0.10 inch south of Fresno, and none in desert areas. In Oregon, weekly totals, ranging from 0.25 to over 0.50 inch east of the Cascades and 1 to 3 inches in the west, were well above normal over the entire State, and totals for March at some stations are already 200 percent of normal.

Precipitation was moderate to heavy from the east-central Great Plains eastward, fanning out along the east coast from western New York and southern New England to northeastern Florida. Only light amounts were recorded in most of the remainder of the Great Plains, the upper Mississippi Valley and Great Lakes region, most of New England, and along the Gulf Coast.

Violent thunderstorms and some tornadoes occurred in west Texas Friday night, and in north-central and east Texas Sunday afternoon and evening. Tornadoes also occurred in northeastern Oklahoma on the 26th and thunderstorms, some with damaging winds, northward through eastern Kansas and Nebraska.

Snowfall during the week increased the snowpack in the Sierras and in some areas of the central and northern Rocky Mountains. Moderate to heavy snowfall on the 19th and 20th covered large areas of the southwestern Great Plains, with depths ranging up to 5 inches; all of which had melted by the 22d. During the middle of the period, snow and sleet fell in the Appalachians as far south as western Maryland and northern West Virginia, with falls up to 5 inches on the western slopes in Pennsylvania and 5 to 8 inches in northern New Jersey.

The snow cover east of the Rockies retreated to Upper Michigan, south-central New York and interior New England during the week. Depths now are only a few inches in the northern Great Lakes region and south-central New York, but range up to 2 feet or more in central and northern Maine. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (*Toxoptera graminum*) - OKLAHOMA - Populations continued to build up in small grains throughout most of State. Severe infestations more common in all affected areas than a week ago despite widespread rains over State during period March 16-19. "Greenbug spots" noted in 40-50 percent of small grain checked in Love and Marshall Counties; 20 percent of fields in Bryan County reported treated; greenbug increasing in southwest and west central areas (high percentage now winged); spots common in many fields in central area; appearing in scattered fields in north central area; apparently spreading into new portions of northwest area. Infestations continued to vary greatly from field to field within affected areas. Parasitic wasps noted in small numbers in many fields throughout State. (Okla. Coop. Sur.). TEXAS - Populations continue light to heavy in panhandle, north central and northeast counties. Heaviest populations reported from Hardeman (2,000 per linear foot), Foard (1,000 per linear foot), Kaufman (500 per foot in some fields) and Motley Counties. Heavy counts of lacewings and other beneficial insects present. (Pallmeyer, Daniels, Doering). Locally heavy and, in some cases, damaging infestations present, mainly in volunteer fields in Denton and Wichita Falls areas. In general, small grains look very good following heavy rains. No *Aphidius tritici* parasites observed, but coccinellid larvae appearing in fields. (Chada). NEW MEXICO - Averaged 1-5 per linear foot in fields of grain checked in De Baca County; averaged 3-28 per linear foot in fields of grain in Tucumcari area, Quay County, with some heavier, spotty infestations. Much lighter in fields of grain in Curry and Roosevelt Counties. Occasional specimen found in fields in Lea and Eddy Counties. (N. M. Coop. Rpt.).

ENGLISH GRAIN APHID (*Macrosiphum granarium*) - OKLAHOMA - Common in fields of small grain throughout most of State. Populations continued fairly uniform in most areas with no particularly high counts reported. (Okla. Coop. Sur.). TEXAS - Common in most fields of grain examined in Denton and Wichita Falls areas. (Chada).

CORN LEAF APHID (*Rhopalosiphum maidis*) - TEXAS - Very heavy in fields of barley; barley in poor condition due to heavy infestations of this pest in combination with severe leaf rust infection. (Chada). ARIZONA - Heavy on barley in Theba area of Maricopa County; also heavy on safflower in same county. (Ariz. Coop. Sur.).

APPLE GRAIN APHID (*Rhopalosiphum fitchii*) - OKLAHOMA - Infestations common throughout State in small grains, but varied greatly from field to field within any given area. Counts ranged 10 to several thousand per linear foot in fields surveyed. (Okla. Coop. Sur.).

WINTER GRAIN MITE (*Penthaleus major*) - OKLAHOMA - Light numbers common in fields of small grain in western half of State; causing some concern to growers in isolated areas of State. Overall outlook continued light. (Okla. Coop. Sur.). TEXAS-Populations heavy over most of rolling plains area; grain is growing rapidly and little damage is apparent. (Thomas). Infestations very light in Denton and Wichita Falls areas. (Chada).

BROWN WHEAT MITE (*Petrobia latens*) - OKLAHOMA - Although number of reports continued to increase somewhat over those of a week ago, populations continued generally light. Infestations noted in fields of small grain throughout Texas County and elsewhere in isolated areas in western third of State. (Okla. Coop. Sur.).

CHINCH BUG (*Blissus leucopterus*) - TEXAS - Appearing in fields of small sorghum in south central counties in fairly heavy numbers; destroying stands in some fields in Bee and Live Oak Counties. (Texas Coop. Rpt., Edgar). Generally heavy in Calhoun County; controls being applied. (Cook).

EUROPEAN CORN BORER (*Pyrausta nubilalis*) - NORTH DAKOTA - Hettinger and Billings Counties, in western portion of State, reported infested for first time. Detection survey underway in other counties. (N. D. Ins. Sur.).

AN ARMYWORM (*Leucania latiuscula*) - FLORIDA - Nearly defoliated several acres of sugarcane plants at Belle Glade, Palm Beach County. (Genung).

SEED-CORN MAGGOT (*Hylemya cilicrura*) - NORTH CAROLINA - Adults hovering at dogwood trees in Hoke County. (Chadwick, Farrier).

GRASSHOPPERS - TEXAS - Nymphal populations of several species becoming light in abundance; egg checks revealed some dehydration. (Russell, Preston). CALIFORNIA- Check of area northwest of Red Bluff, Tehama County, where fairly heavy adult populations of *Melanoplus devastator* occurred during January, showed only an occasional grasshopper present. (Cal. Coop. Rpt.).

ALFALFA WEEVIL (*Hypera postica*) - DELAWARE - Very little change over report of last week. Some feeding injury noticeable in form of small, round pin holes in young, folded, new leaves of alfalfa. First and second-instar larvae present but remain low in numbers; only slight increase in hatch of overwintering eggs detected. (Burbutis, Mason). MARYLAND - Light numbers of adults and apparently new larvae observed on alfalfa in Queen Annes County. (U. Md., Ent. Dept.). TENNESSEE - Larvae averaged 3 per terminal in several fields in Greene and Washington Counties. Light infestations present in Unicoi, Carter, Sullivan and Johnson Counties. This is the first time the pest has been reported in Washington and Unicoi Counties. (Bennett). SOUTH CAROLINA - In Laurens County, heavy damage has already occurred to alfalfa that was not treated during the fall of 1960; this is in contrast to alfalfa nearby that was treated. Damage is present in Oconee County and plans are underway to apply controls. Considerable damage is also present in Anderson County in fields treated with certain chlorinated hydrocarbons. (Nettles et al.). GEORGIA - Light to moderate on alfalfa in Cherokee County (Moore) and moderate to heavy on same crop in Oconee County (Johnson). COLORADO - No feeding damage observed. (Colo. Ins. Sur.). UTAH - Adult survival has been high in northern portion of State; several hundred fields of alfalfa have been treated this spring. (Knowlton). IDAHO - Numerous adults active in fields of alfalfa in Lewiston area, Nez Perce County; no egg laying noted to date. (Gittins).

EGYPTIAN ALFALFA WEEVIL (*Hypera brunneipennis*) - ARIZONA - Continued heavy on Yuma-mesa, Yuma County. In Maricopa County, counts averaged as much as 10 per sweep in some fields south of Tempe. (Ariz. Coop. Sur.).

CLOVER LEAF WEEVIL (*Hypera punctata*) - MARYLAND - Light larval numbers noted in fields of alfalfa in Queen Annes County. (U. Md., Ent. Dept.). IDAHO - First report of activity in Idaho County for 1961 made March 9 following observations in the Grangeville area. (Cook).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - OKLAHOMA - Populations increasing in fields of alfalfa throughout southwest, south central and central areas; moderate to heavy infestations noted in an increasingly higher percentage of fields checked this week. Only light numbers noted in fields checked in southeast area, but reported increasing there also. Chemical controls applied to some fields in those areas. (Okla. Coop. Sur.). TEXAS - Averaged 10-20 per sweep in alfalfa in Brazos County (Doering); very light infestations observed in Denton and Wichita Falls areas (Chada). NEW MEXICO - Occasional light to moderate infestation found in alfalfa in Chaves and Eddy Counties. (N. M. Coop. Rpt.). CALIFORNIA - Light populations of this species and *Macrosiphum* sp. present on alfalfa in Riverside area, Riverside County. (Cal. Coop. Rpt.).

PEA APHID (*Macrosiphum pisi*) - OKLAHOMA - Populations continued high in fields of alfalfa and vetch in western two-thirds of State; continued to increase to threatening proportions in some fields in eastern third. (Okla. Coop. Sur.). TEXAS - Averaged 50-100 per sweep in Brazos County alfalfa. (Doering). Very heavy infestations in alfalfa in Denton and Wichita Falls areas; farmers becoming concerned. (Chada). NEW MEXICO - Heavy in fields of alfalfa in De Baca, Roosevelt, Quay, Eddy and Chaves Counties, with many growers treating. Causing severe damage to plants where controls have not been applied. (N. M. Coop. Rpt.). NEVADA - Trace to light on alfalfa in Reno-Sparks, Washoe County. (Bechtel, Gardella, Lauderdale). IDAHO - It appears likely that this pest will be abundant again on alfalfa during the 1961 growing season in the State and damage can be expected in many southern areas. (Gittins). DELAWARE - Present but very scarce on alfalfa in eastern Sussex County. (Burbutis, Mason).

LYGUS BUGS (*Lygus* spp.) - ARIZONA - Adults and nymphs averaged 7 per 10 sweeps in central area alfalfa. (Ariz. Coop. Sur.). NEVADA - Adults active in southern Washoe County. (Coop. Rpt.). IDAHO - Adults present in greater than normal numbers throughout many areas of south central and southwestern portions of State. (Gittins). COLORADO - Few adults present. (Colo. Ins. Sur.).

STINK BUGS - TEXAS - Light, local infestations of several species attacking alfalfa in Washington County. (Texas Coop. Rpt., McClung).

ARMY CUTWORM (*Chorizagrotis auxiliaris*) - NEVADA - Larvae, probably this species, maturing in alfalfa in Douglas County, with plants showing noticeable regrowth. (Lauderdale). Infestations light and spotted in Yerington, Lyon County. (Batchelder). Light, scattered infestations, probably this species, in lawns in Reno, Washoe County. (Bechtel). IDAHO - Reports continue to be received regarding cutworm infestations in the State and at present, heavier than normal infestations are expected. However, infestations are not expected to reach those proportions seen on rangelands during 1960. Greatest concern is possible infestations in croplands during 1961. (Gittins). NEBRASKA - Larvae active in wheat in Dundy County and on pastureland in Deuel County. (Bergman).

ALFALFA CATERPILLAR (*Colias eurytheme*) - TEXAS - Light infestations found in fields of alfalfa in Brazos County. (Doering). CALIFORNIA - Light populations present on alfalfa in Riverside area, Riverside County. (Cal. Coop. Rpt.).

GREEN CLOVERWORM (*Plathypena scabra*) - TEXAS - Light in fields of alfalfa in Brazos County. (Doering).

CUTWORMS - NEBRASKA - Larvae of *Feltia ducens* active in alfalfa in Greeley County. (Bergman). NEW MEXICO - An undetermined species causing damage to fields of wheat in Curry County. (N. M. Coop. Rpt.).

THRIPS - NEW MEXICO - Populations much lighter in alfalfa in southern counties than at same time during past 3 years. (N. M. Coop. Rpt.).

A GRASSWORM (*Mocis* sp.) - FLORIDA - Averaged one larva per square foot in pastures and lawns near Bradenton, Manatee County; larvae one-third to one-half grown. Populations will possibly be heavy later in season as result of this early population. (Kelsheimer).

FRUIT INSECTS

PLUM CURCULIO (*Conotrachelus nenuphar*) - GEORGIA - Fully developed, mature eggs found in bodies of females taken from commercial peach orchard at Ft. Valley on March 15. Therefore, egg deposition in peaches will occur as soon as shuck starts to split from fruit. Adults continue to leave hibernation in numbers. An average of 1.6 adults per tree was taken from a commercial peach orchard at Ft. Valley on March 15. (Snapp).

APPLE APHID (*Aphis pomi*) - DELAWARE - First appearance noted on apple buds in Sussex County. (L. Kelsey). MARYLAND - Eggs hatching on apple at a locality in Talbot County. (U. Md., Ent. Dept.).

APHIDS - NEW JERSEY - Few young forms observed on Staymen and Starr varieties of apples during period March 13-17; eggs numerous on Staymen variety and fully extended, ready to hatch with first warm weather. (Ins.-Dis. Newsl.).

LYGUS BUGS (Lygus spp.) - UTAH - Active in orchards and along weedy roadsides in Salt Lake, Weber and Davis Counties; survival evidently above normal. (Knowlton).

A COREID (Leptocoris rubrolineatus) - CALIFORNIA - Adults heavy on leaves of avocado trees in Corona, Riverside County. (Cal. Coop. Rpt.).

A PHYLLOXERA (Phylloxera sp.) - MARYLAND - Galls heavy on dead pecan leaves at a locality in St. Marys County. (U. Md., Ent. Dept.).

Citrus Insect Situation in Florida - Mid-March - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 67 percent of groves (norm 60 percent); 38 percent economic (norm 34 percent). Activity increasing and infestations will be well above average. Highest districts are Bartow, west coast, Brooksville, Ridge, Indian Rover and Orlando. CITRUS RED MITE (Panonychus citri) infested 45 percent of groves (norm 69 percent); 20 percent economic (norm 41 percent). Populations increasing and mites moving onto new leaves. Although statewide level of infestation will be in low range, moderate to heavy infestations may be expected in scattered groves. Highest districts are upper east coast, Brookville and Orlando. TEXAS CITRUS MITE (Eutetranychus banksi) infested 18 percent of groves; 7 percent economic. Situation is same as for citrus red mite. Highest districts are Brooksville and Indian River. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) infested 3 percent of groves; less than 1 percent economic. Infestations will increase but will continue minor in importance. FLORIDA RED SCALE (Chrysomphalus aonidum) infested 53 percent of groves (norm 48 percent); 7 percent economic (norm 6 percent). Populations will continue in average range. An increase is expected in warmer areas as hatching increases and crawlers move to new foliage. Highest districts are Indian River and Bartow. PURPLE SCALE (Lepidosaphes beckii) infested 88 percent of groves; 8 percent economic. Light infestations will prevail except in a few scattered groves. APHID populations are low and will continue below average. (Simanton, Thompson, Johnson (Citrus Exp. Sta., Lake Alfred)).

COCCIDS - TEXAS - Heavy, widespread infestations of undetermined species attacking home citrus orchards in Bee and Live Oak Counties. (Texas Coop. Rpt., Edgar). CALIFORNIA - Aspidiotus perniciosus heavy on prune in Gridley, Butte County; Icerya purchasi light on citrus and rose in Colusa, Colusa County; and Parlatoria oleae medium on walnut in Sanger, Fresno County. (Cal. Coop. Rpt.).

CITRUS BLACKFLY (Aleurocanthus woglumi) - MEXICO - Surveys were conducted in the chemical control and free zones in the States of Tamaulipas, Nuevo Leon, Sonora and Baja California on 147,613 citrus trees on 3,158 properties. Infestations were found in 18 trees on 7 properties in Allende and 3 trees on one property in Linares; both in Nuevo Leon. (PPC, Mex. Reg.; Feb. Rpt.).

MEXICAN FRUIT FLY (Anastrepha ludens) - TEXAS - During February, 1,399 traps were operated on 81 properties in 11 counties. Unfavorable weather limited trap inspections; however, 7 positive specimens were trapped as follows, by county: Cameron - 1 female; Hidalgo - 3 males, 1 female; Starr - 2 females. None of females were gravid. This makes a total of 9 A. ludens trapped during 1961. Grove inspections for possible larval infestations were made on 12 properties with negative results. (PPC, So. Reg.). CALIFORNIA - Trapping activites and larval inspections were continued in San Diego County during February with negative results. (PPC, West. Reg.).

MEDITERRANEAN FRUIT FLY (Ceratitis capitata) - MEXICO - At the end of February, 1,744 traps were in service in the following vicinities of the State of Chiapas: Tuxtla Gutierrez - 386; Comitan - 325; Tapachula - 1,033. A total of 3,043 trap inspections were made with negative results. (PPC, Mex. Reg.).

WHITEFLIES - TEXAS - Heavy, widespread infestations of undetermined species attacking home citrus orchards in Bee and Live Oak Counties. (Texas Coop. Rpt., Edgar).

A FLEA BEETLE (Altica torquata) - CALIFORNIA - Adults light on grapes in Thermal, Riverside County. (Cal. Coop. Rpt.).

TRUCK CROP INSECTS

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) - DELAWARE - Few larvae found infesting sweet peppers during August 1960. Det. by J. F. G. Clarke. (Burbutis, Mason).

GOLDEN NEMATODE (Heterodera rostochiensis) - NEW YORK - On Long Island, an additional 7 fields totaling approximately 612 acres were found to have initial infestations, bringing the total infestations of the fall survey to 12 fields and approximately 935 acres. (PPC, East. Reg.; Feb. Rpt.).

CUTWORMS - FLORIDA - Undetermined species damaging watermelon in Basinger area, Okeechobee County, and in Brighton area, Highlands County. (Hayslip).

GREEN PEACH APHID (Myzus persicae) - FLORIDA - Heavy on cabbage at Belle Glade, Palm Beach County. (Genung). DELAWARE - Slight increase on spinach in Sussex County, but numbers remain very low. (Burbutis, Mason).

HARLEQUIN BUG (Murgantia histrionica) - OKLAHOMA - Damaging turnips in localized areas of Okfuskee County. (Okla. Coop. Sur.).

CABBAGE APHID (Brevicoryne brassicae) - GEORGIA - Light to moderate on cabbage in Colquitt County. (Johnson).

IMPORTED CABBAGEWORM (Pieris rapae) - GEORGIA - Light on cabbage in Colquitt County. (Johnson).

AN APHID (Macrosiphum barri) - ARIZONA - Populations continue to increase and are medium on some lettuce in central area. (Ariz. Coop. Sur.).

A SERPENTINE LEAFMINER - FLORIDA - Serious stage nearly past due to biological and chemical controls. Growers not concerned at Homestead, Dade County; however, the pest could be a threat at Ft. Pierce, St. Lucie County, if controls were not applied. (Fla. Coop. Sur.).

A NOCTUID (Proxenus mindara) - CALIFORNIA - Pupae light in strawberry plantings in Watsonville area, Santa Cruz County. (Cal. Coop. Rpt.).

TOBACCO INSECTS

VARIEGATED CUTWORM (Peridroma saucia) - FLORIDA - Collected on shade tobacco at Quincy, Gadsden County, February 28; one infestation in the field has been observed. Appearances indicate cutworms will be of more concern during 1961 than they were during 1960. (Tappan).

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Light to moderate on tobacco in the plant bed in Ben Hill, Irwin, Tift, Berrien, Cook and Colquitt Counties. (Johnson).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light to moderate on tobacco in the plant bed in Ben Hill, Irwin, Tift, Berrien, Cook and Colquitt Counties. (Johnson).

COTTON INSECTS

BOLL WEEVIL (*Anthonomus grandis*) - MISSISSIPPI - Survival surveys begun March 2 and completed March 20. Woods trash samples to determine the number of adults that survived the winter were collected by personnel of the Plant Pest Control Division and were processed by personnel of the Entomology Research Division. In each county, either 7 or 8 samples were taken. Wherever possible, samples were taken at the same locations that were sampled during the hibernation survey in the fall of 1960. Four counties make up each area and the State was divided into four areas as follows: lower delta (Sharkey, Issaquena, Yazoo, Humphries Counties); central delta (Washington, Bolivar, Sunflower, Leflore Counties); north delta (Coahoma, Tunica, Quitman, Panola Counties); and hill section (Holmes, Madison, Noxubee, Monroe Counties). Ninety samples were taken from a total of 30 locations in each of the four areas, making a total of 360 samples taken in the State. The State average was 1,247 live weevils per acre in 1961 compared with 821 in the spring of 1960 and 464 in the spring of 1959. The average number of live weevils going into hibernation in the State in the fall of 1960 was 14,502 per acre, compared with 5,127 in 1959 and 3,792 in the fall of 1958. (M. E. Merkl). ARKANSAS - Trash samples recently examined for overwintering adults. Only 9 weevils recovered from 132 square yards of ground trash taken in 7 counties along Arkansas River in western area. This is at the rate of only 329 live weevils per acre. (Ark. Ins. Sur.). TEXAS - Spring collections of woods trash were started on March 13 and completed by March 23. Collections were made from the same locations in Falls, Hill, Limestone and McLennan Counties from which samples were collected in the fall of 1960 (November and December). Each sample consisted of two square yards of trash. Three samples were taken from each location and either 6 or 7 locations were sampled in each county. Seventy-five samples were taken from a total of 25 locations in the 4 counties. The average number of weevils found per acre in Falls, Hill, Limestone and McLennan Counties was 3,898, 535, 269 and 1,382 respectively, with an area average of 1,516. This compares with 7,647, 3,485, 2,710 and 4,259 found in the respective counties in the fall of 1960 with an average of 4,501 for the area. The survival percentage for the area was 33.7 compared with a survival percentage of 31.14 in March of 1960. The average number of weevils found in hibernation in the fall of 1959 was 6,631 and an average of 2,065 was found in the same locations in the area in March of 1960. Fewer weevils were found in the fall inspections in 1960 than in 1959. There was very little difference in the indicated survival in the spring of 1960 and 1961, although it was slightly higher in the latter year. (C. R. Parencia, C. B. Cowan, J. W. Davis).

CUTWORMS - TEXAS - Light infestations of unspecified species appearing in Bee and Live Oak Counties. (Texas Coop. Rpt., Edgar).

COTTON APHID (*Aphis gossypii*) - TEXAS - Light in 8 of 13 fields of cotton checked in Cameron County. (Texas Coop. Rpt.; Day, Kalktik).

SPIDER MITES - TEXAS - Infestations of unspecified species range light to heavy in 9 of 13 fields of cotton checked in Cameron County. (Texas Coop. Rpt.; Day, Kalktik).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SILVER-SPOTTED TIGER MOTH (*Halisidota argentata*) - WASHINGTON - Moderate to rather heavy infestation on Douglas-fir trees in shipyard area of Bremerton, Kitsap County. (Buehler).

A WEEVIL (*Scythropus californicus*) - CALIFORNIA - Light infestation present on Monterey pine in Martinez, Contra Costa County. (Cal. Coop. Rpt.).

SPRING CANKERWORM (*Paleacrita vernata*) - NEBRASKA - Males and females have been active during past 2 weeks in Lincoln area, Lancaster County. (Bergman).

EASTERN TENT CATERPILLAR (*Malacosoma americanum*) - FLORIDA - Collected on black cherry (*Prunus serotina*) March 12, at Gainesville, Alachua County. Most larvae have now completed feeding and are migrating in search of cocooning locations. Det. by L. A. Hetrick. (Hetrick).

ELM LEAF BEETLE (*Galerucella xanthomelaena*) - OKLAHOMA - Adults becoming active and attacking elms over wide area of State; reported from north central, central and east central areas. (Okla. Coop. Sur.).

ELM CALLIGRAPHA (*Calligrapha scalaris*) - OKLAHOMA - Adults attacking elms in Enid area, Garfield County. (Okla. Coop. Sur.).

A FLATHEADED BORER (*Dicerca horni*) - CALIFORNIA - Light in elm in Riverside, Riverside County. (Cal. Coop. Rpt.).

A SPIDER MITE (*Bryobia rubrioculus*) - OREGON - Larvae heavy on alder at La Pine, Deschutes County. (Every).

AZALEA LEAF MINER (*Gracilaria azaleella*) - PENNSYLVANIA - Averaged 7-10 per plant on over 2,000 azaleas in a greenhouse at Connellsville, Fayette County. Also present in other greenhouses in western part of State. (Udine,Feb. 16). OREGON - Particularly abundant on evergreen azalea in the Eugene area, Lane County. Adults were emerging the week of March 19. (Goeden).

A COSMOPTERYGID (*Periploca* n. sp.) - CALIFORNIA - Heavy infestations occurring on *Juniperus sabina tamariscifolia* in San Mateo County. This is an apparent, general, damaging infestation of junipers, which is appearing abruptly at this time. (Cal. Coop. Rpt.).

LEAF MINERS - OREGON - Undetermined species infested half of leaves of a 100-foot bed of snapdragons in a Salem nursery March 14. (Loring).

DOGWOOD BORER (*Thamnosphecia scitula*) - OREGON - Inspections of dogwood stock imported from Eastern States has been intensified in recent months following 1960 discovery of small, localized infestations of dogwood by this pest. No further infestations have been found, with over 100,000 plants examined. (Wieman).

APHIDS - OKLAHOMA - Several species becoming increasingly common on variety of flowering plants and shrubs throughout State. (Okla. Coop. Sur.). ARIZONA - Very heavy infestations of various species reported on a variety of flowering and ornamental plantings in central area of State. (Ariz. Coop. Sur.).

COCCIDS - CALIFORNIA - *Situlaspis multipora* heavy on mistletoe on black oak in Yucaipa, San Bernardino County. The only other known infestations of this species occur in San Diego County. (Cal. Coop. Rpt.). OREGON - Infestations of *Diaspis carueli* caused severe devitalization of large junipers in a nursery in Corbett, Multnomah County. (Loring). NORTH CAROLINA - Severe infestations of *Icerya purchasi* on various shrubs locally in Sampson County. (Jones, Farrier).

A CHRYSOMELID (*Altica* sp., probably *prasina*) - OREGON - Defoliated nursery stock in a greenhouse at Portland, Multnomah County, on March 16. (Nicolaison).

BOXWOOD LEAF MINER (*Monarthropalpus buxi*) - MARYLAND - Larvae seriously injuring an American boxwood at Cenreville, Queen Annes County. (U. Md., Ent. Dept.).

AN OAK GALL - PENNSYLVANIA - Caused considerable injury to pin oak in a nursery in Allegheny County by causing branches to break at gall. (Udine).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (Hypoderma spp.) - OKLAHOMA - Adults of H. lineatum active over wider area in southern half of State. (Okla. Coop. Sur.). NORTH DAKOTA - Examination of 504 head of cattle at western area sales yards showed 54.4 percent of animals infested. Of the 274 infested animals, infestation was light in 50 percent, medium in 26.3 percent and heavy in 23.7 percent. (N. D. Ins. Sur.). IDAHO - Adults of Hypoderma sp. irritating calves in barn lots in the Grangeville area of Idaho County as early as March 9. (Spencer, Cook).

FACE FLY (Musca autumnalis) - INDIANA - Adults observed out of hibernation and on sides of farm buildings and fence posts in northern Tippecanoe County, March 25. This is first reported appearance of this insect this season; both males and females were observed. Although no cattle were present around infested farm buildings, no flies were observed on cattle on adjacent farms. (Matthew). NEBRASKA - Adults overwintered in farm home in Lancaster County. (Bergman).

MOSQUITOES - DELAWARE - Second-instar larvae of Aedes grossbecki collected at Bombay Hook, Kent County, from woodland pool on March 6; and fourth-instar larvae of A. thibaulti collected March 21 in Redden State Forest, Sussex County. These 2 species are rare in the State. Second-instar larvae of A. cantator abundant at Bombay Hook on March 6. (Lake). UTAH - Hatching first observed in Weber County March 2, with increasing numbers of larvae to date. Aedes dorsalis and A. increpitus most common species found in river bottom areas. Few Anopheles freeborni and one Culiseta sp. have been taken as adults. In Cache County, few A. freeborni adults have also been taken. (Fronk, Knowlton).

SHEEP KED (Melophagus ovinus) - NEW MEXICO - Infestations on sheep being sheared in Guadalupe County are much lighter than for several years. It is difficult to find infested ewes in some flocks that have been properly treated. In untreated flocks, rams especially were found to have light to relatively heavy infestations. (N. M. Coop. Rpt.).

LICE - OKLAHOMA - Moderate to heavy infestations of several species continue common on untreated cattle in most areas of State. Moderate to heavy infestations of Haematopinus suis continued common on untreated hogs in many areas. (Okla. Coop. Sur.).

LONE STAR TICK (Amblyomma americanum) - OKLAHOMA - Beginning to cause some concern to cattle raisers in Latimer County; averaged 2 per animal on cows checked in McCurtain County. (Okla. Coop. Sur.).

STORED-PRODUCT INSECTS

KHAPRA BEETLE (Trogoderma granarium) - During February, surveys were made in MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA and VIRGINIA, and one repeat inspection was made at the Wilmington Marine Terminal, Wilmington, DELAWARE. All results have been negative to date. (PPC, East. Reg.). All inspections made in ALABAMA, ARKANSAS, FLORIDA, GEORGIA, MISSISSIPPI, NORTH CAROLINA, SOUTH CAROLINA and TENNESSEE during February were negative. In TEXAS, 1,147 properties in 57 counties were inspected, with 141 collections made. The most intensive survey was in the El Paso section, where 929 separate properties were inspected and 128 collections submitted for determination. At the end of February, negative determinations had been received on about half of the submitted specimens. (PPC, So. Reg.). There were 5 infestations found during February in ARIZONA. At the end of the month there were 7 active infestations in the State, 5 in Yuma County, and one each in Maricopa and Pinal Counties. (PPC, West. Reg.). In MEXICO, a total of 63 inspections were made in the Mexicali Valley of Baja California and Sonora, and in Obregon, Sonora, with 47 specimens submitted for identification; no positive determinations were received. (PPC, Mex. Reg.; Feb. Rpt.).

BENEFICIAL INSECTS

LADY BEETLES - OKLAHOMA - Hippodamia convergens and Chilocorus stigma beginning to control aphids on ornamentals in Stillwater area, Payne County. Light to medium numbers of H. convergens common in alfalfa and small grains in most areas of State. (Okla. Coop. Sur.). NEW MEXICO - Adults and larvae of unspecified species abundant in fields of grain infested with greenbug in Quay and Curry Counties. (N. M. Coop. Rpt.). NEVADA - Trace to light populations of unspecified species present in alfalfa in Fallon, Churchill County, and Reno-Sparks, Washoe County. (Bechtel et al.). IDAHO - Unspecified species becoming active in alfalfa in Marshing and Homedale regions of Owyhee County, following emergence from hibernation quarters. (Noble).

NABIDS (Nabis spp.) - NEVADA - Trace to light populations present in alfalfa in Fallon, Churchill County, and Reno-Sparks, Washoe County. (Bechtel et al.). NEW MEXICO - Adults abundant in fields of grain infested with greenbug in Quay and Curry Counties. (N. M. Coop. Rpt.).

LACEWINGS (Chrysopa spp.) - OKLAHOMA - Light to medium numbers noted in few fields of alfalfa and small grain in south central and southwest areas. (Okla. Coop.Sur.).

A MANTID (Brunneria borealis) - NORTH CAROLINA - Egg masses numerous on azaleas, dogwood, oaks and wire fences in Robeson County. (Jones, Farrier).

BRACONID PARASITES - OKLAHOMA - Aphidius testaceipes becoming more common in small grain infested with aphids in most areas of State; populations remain light in most cases. (Okla. Coop. Sur.). WASHINGTON - Adults of A. pisivorus obtained from overwintering mummies in fields of alfalfa indicate this parasite of pea aphid has survived 2 winters since release. (Woodworth).

AN ICHNEUMONID (Blathypectes curculionis) - NORTH CAROLINA - Released March 23 north of Hillsboro, Orange County, in abandoned field of alfalfa for possible colonization as a parasite of alfalfa weevil. (Farrier, Huggins).

MISCELLANEOUS INSECTS

AN ASH BORER (Neoclytus caprea) - OKLAHOMA - Causing some concern to homeowners in north central area. Apparently brought in with firewood. (Okla. Coop. Sur.).

A WEEVIL (Dynatopechus sp., probably calandrodes) - CALIFORNIA - Adults emerged in heavy numbers from a string of seed beads (possibly monkeypod seeds) made into a necklace and purchased in Hawaii during the spring of 1960. This pest is not known to occur in the Continental United States and is known to attack lima beans in Hawaii. The infestation occurred in a home in Huntington Beach, Orange County. (Cal. Coop. Rpt.).

A CERAMBYCID (Phymatodes testaceus) - PENNSYLVANIA - Collected on window sills of a home in Clearfield on February 2, and in a home at Beaver on March 2. (Adams).

BOXELDER BUG (Leptocoris trivittatus) - NEBRASKA - A nuisance in numerous homes in Lincoln area, Lancaster County. (Bergman). NEVADA - Moderate numbers of adults active in Reno, Washoe County. (Bechtel).

A LYGAEID (Peritrechus tristus) - OREGON - Large numbers present in and around homes at Coquille, Coos County, during March. Det by J. D. Lattin. (Every).

HOUSE FLIES - WISCONSIN - Some activity noted in southern area during past few days. (Wis. Coop. Sur.).

CLUSTER FLY (Pollenia rudis) - PENNSYLVANIA - Numerous around homes in southwest during March. (Udine). UTAH - Troublesome in several homes at Ogden, Logan and Salt Lake City. (Knowlton).

TERMITES - NEW JERSEY - Winged forms of unspecified species becoming active. (Ins.-Dis. Newsl.). MARYLAND - Winged forms of Reticulitermes flavipes noted in buildings at several localities in Prince Georges County. (U. Md., Ent. Dept.). NORTH CAROLINA - R. flavipes swarming in a dwelling in Johnston County. (Farrier). UTAH - Unspecified species damaging several homes in Salt Lake-Magna area of Salt Lake County. (Knowlton). OREGON - Reticulitermes hesperus reported damaging homes in several areas of State during past few weeks. (Every, Mar. 18).

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - NORTH CAROLINA - Two infestations consisting of 4 acres found in Onslow County. (Branan). Grant Parish, LOUISIANA, was found infested for first time during February, with only one acre being involved. Two new incipient infestations found outside treated areas in Union County, ARKANSAS; one about 3 miles from nearest previously known infestations. All surveys in previously treated areas of Union County have been negative. First heavy nuptial flight was observed on February 15 in ALABAMA. (PPC, So.Reg.).

SOUTHERN FIRE ANT (Solenopsis xyloni) - NORTH CAROLINA - Found for first time in State September 16, 1960, near Peachland, Anson County. Infested area consisted of about 300 yards along railroad embankment. About 40 mounds, 3-10 inches high, were in the area, covered by sparse vegetation consisting of Bermuda grass and scattered weeds. Det. by M. R. Smith. (Savage, Wray).

ANTS - NEW JERSEY - Winged forms of unspecified species becoming active. (Ins.-Dis. Newsl.). MARYLAND - Wingless forms of Tetramorium caespitum and Acanthomyops interjectus causing a nuisance in and around homes in Montgomery and Prince Georges Counties. (U. Md., Ent. Dept.). OREGON - Lasius sp. entering homes at several locations in Willamette Valley. (Capizzi, Mar. 18).

EUROPEAN EARWIG (Forficula auricularia) - IDAHO - Overwintering adults becoming active around homes in many scattered areas of State. Controls should be initiated at this time. (Gittins).

CLOVER MITE (Bryobia praetiosa) - NEBRASKA - Moderate numbers annoying in homes in Lincoln area, Lancaster County. (Bergman). IDAHO - General in and around homes, sometimes abundantly, in Caldwell area, Canyon County. (Bechtolt).

BROWN GARDEN SNAIL (Helix aspersa) - OREGON - Collected by James Curran at Coquille, Coos County, for a new State record. Det. by J. Capizzi. (Capizzi).

CORRECTIONS

CEIR 11(6):58 - COCCIDS - CALIFORNIA - Asterolecanium arabidis - Should read "heavy on pittosporum in Marysville, Yuba County, and very light on a few small oaks in parks in Sacramento, Sacramento County". Asterolecanium minus was found to be the species attacking the large oak trees in Sacramento County. The trees have been sprayed repeatedly, but have not responded to the treatment.

CEIR 11(8):89 - EUROPEAN CORN BORER (second paragraph) - NORTH DAKOTA - Second line from bottom of page should read:".....June 27, moth emergence began the week of July 4 and egg laying peaked the week......"

LIGHT TRAP COLLECTIONS

	Pseud. unip.	Agrot. ips.	Feltia subterr.	Perid. saucia	Prod. ornith.	Trich. ni
ARIZONA						
Mesa 3/13-19				2	1	5
ARKANSAS						
Kelso 3/16-22	1			6		2
Morrilton 3/16-22	6			4		
FLORIDA						
Quincy 3/15		2	2			
Monticello 3/14, 21		2	38		1	
MISSISSIPPI						
*Stoneville 3/17-23	108	8	2	109	2	
SOUTH CAROLINA						
Charleston 3/20-26	3	9	11	6		
Clemson 3/18-24	2				2	
TENNESSEE (Counties)						
Monroe 3/14-20	7	5				
Madison 3/7-20	6	4		1		
Maury 3/7-20	7	1		1	2	
Robertson 3/14-20				1		
Cumberland 3/7-20		7		1		
Greene 3/7-20	1				1	
Blount 3/7-20		7			2	
Johnson 3/7-13					1	
TEXAS						
Brownsville 3/13-17	287	35	260	268		35

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* Two traps - Stoneville

INTERCEPTIONS OF SPECIAL INTEREST AT U. S. PORTS OF ENTRY

Some important interceptions that were reported December 31, 1960, by the Plant Quarantine Division, ARS, USDA, follow. These reports are based on identifications received from Federal taxonomists at the U. S. National Museum during the month of December 1960. They do not necessarily represent interceptions taken during the month, but do include any of special interest from recent months that were not previously reported.

MEDITERRANEAN FRUIT FLY (Ceratitis capitata (Wied.)) 18 times in baggage; at Honolulu, Hawaii, 11 times (10 destined for California and 1 for Oregon); at Miami, Florida, one time; and at New York, New York, 6 times.

MEXICAN FRUIT FLY (Anastrepha ludens (Lw.)) 9 times; 7 times at Brownsville, Texas; one time at Port Arthur, Texas; and one time at Roma, Texas.

KHAPRA BEETLE (Trogoderma granarium Everts) 13 times (9 in cargo, 4 in stores); at Charleston, South Carolina, one time in cargo of "Myrobalan" nuts destined for South Carolina; at Houston, Texas, one time in stores; at New York, New York, 4 times (2 times in cargo of cinnamon quills (burlap wrappings) destined for Mexico and 2 times in cargos of gum arabic from Sudan for New York and Boston, Massachusetts, markets); at Philadelphia, Pennsylvania, one time in stores; at San Pedro, California, one time in stores; and at Wilmington, North Carolina, 5 times.

An OLETHREUTID, presumably Grapholitha janthiana (Dup.), in apples in baggage at Chicago, Illinois, 2 times.

A COSSID (Dyspessa ulula (Bkh.)) in garlic in cargo at San Juan, Puerto Rico.

An OLETHREUTID (Laspeyresia strobilella (L.)) in pine cone in baggage destined for Connecticut, at New York, New York.

LEEK MOTH (Acrolepia assectella (Zell.)) in leek in stores at Philadelphia, Pennsylvania.

A THRIPS (Taeniothrips gracilis Mlt.) on amaryllis bulbs in cargo for general distribution and on cut gladiolus flowers (unusual host plant) in baggage at New York, New York.

A PHYCITID (Cryptoblabes gnidiella (Mill.)) on pomegranates in baggage at New York, New York, 2 times.

A FRUIT FLY (Anastrepha sp., possibly A. fraterculus (Wied.)) in coffee berries in baggage at New York, New York.

A TERMITE (Nasutitermes ephratae (Holmg.)) (numerous workers and soldiers) in pseudobulb of Schomburgkia sp. in cargo for Florida at Miami, Florida.

RED-PINE SAWFLY SURVEY PROCEDURE [1]

by

Joseph E. Kapler [2] and Daniel M. Benjamin [3]

The red-pine sawfly, Neodiprion nanulus nanulus Schedl, is an important defoliator of red pine (Norway pine) in eastern North America. Defoliation occurs in spring and is restricted to needles of the previous seasons even though currently developing foliage is present. Marked reduction in growth may occur after a single season's attack. Prolonged outbreaks resulting in the loss of all old foliage for 3 successive seasons may cause tree mortality.

Evaluation of red-pine sawfly populations is best conducted during the egg stage after oviposition is completed in late fall. Eggs of this species remain on the tree until they hatch the following year in early May. Eggs are readily observed and little or no mortality occurs to interfere with the close relationship between egg numbers and subsequent defoliation. The other life stages all possess characteristics which preclude their utilization as valid and reliable population density criteria.

Red-pine sawfly eggs are inserted into the round face of current season needles near the tips of well exposed branches (Figure 1). They appear as a series of irregularly spaced, pale yellow, oval-shaped spots averaging 8 per needle with 5 to 13 eggs being commonly encountered (Figure 2). Each female lays approximately 50 eggs concentrating them on several adjacent needles.

Sampling procedures are based on temporary plots located at random in red pine stands. The number of plots per 40 acres has been established at 10. In smaller areas 1 plot per 2 acres will suffice, and in areas 100 acres and larger 20 plots will be employed. Time and availability of personnel will temper the intensity of the survey.

The size of the red pines to be examined and stand density will influence the precise procedure employed on each plot. Consequently, it is desirable to establish the program for each of the three major forest classes generally infested.

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[1] Supported in part by the Wisconsin Conservation Department and by the Research Committee of the Wisconsin Alumni Research Foundation. Approved for publication by the Director of the Wisconsin Agricultural Experiment Station.

[2] Assistant Professor, Loras College, Dubuque, Iowa.

[3] Associate Professor, University of Wisconsin, Madison, Wisconsin.

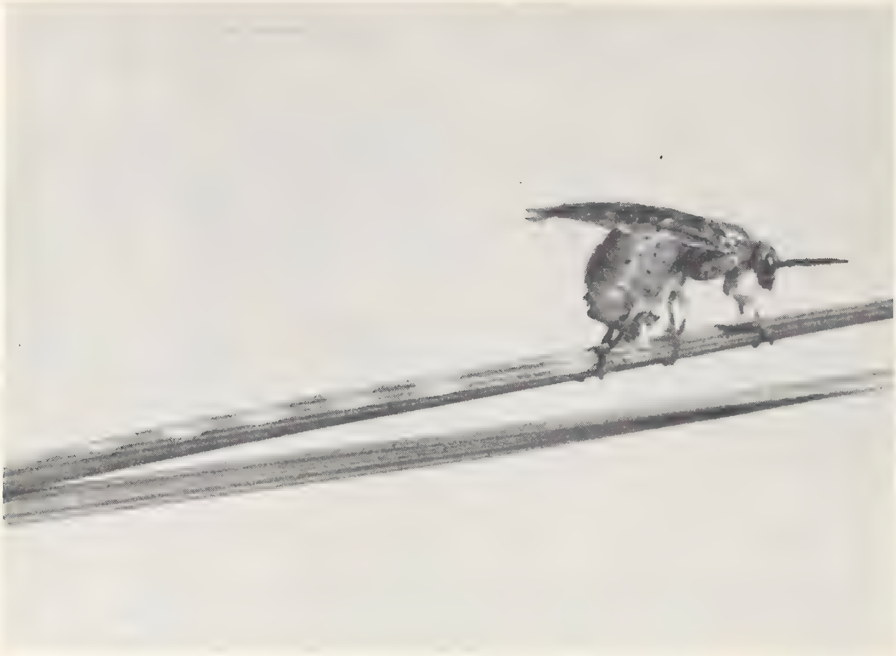

Figure 1. Red-pine sawfly female ovipositing in red pine needles.

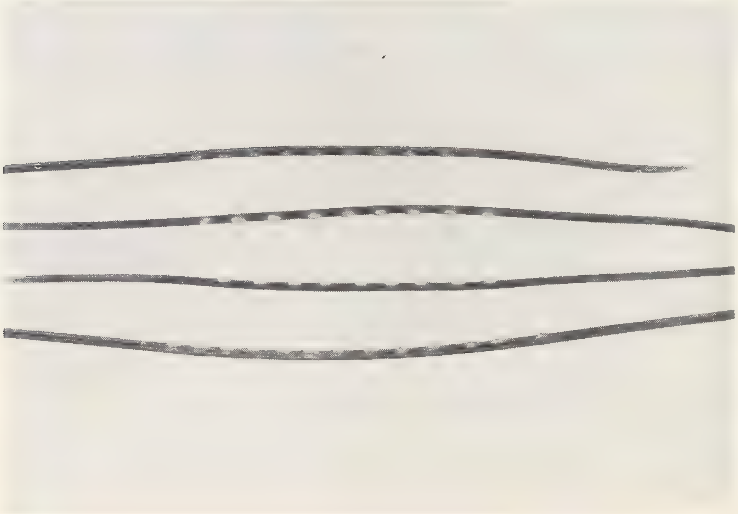

Figure 2. Red pine needles containing eggs of red-pine sawfly.

Plantations Under 15 Feet in Height

In plantations under 15 feet in height, each sample plot will consist of 10 trees selected at random. Five twigs, one each from five different branches having current foliage (i.e., needles that were grown during the recent season) will be examined per tree at b.h. for the presence of sawfly eggs. Thus, at each station a total of 50 current twigs will be examined. The number of current twigs bearing sawfly eggs will be recorded on the attached survey sheet and the data processed to yield an average number of egg-infested twigs per plot per plantation. Infestation classification will be determined by employing the following standards:

Average Number of Egg-Bearing Twigs Per Plot	Infestation Classification	Predicted Defoliation (Percent of Old Foliage)
0 to 9	Light	0 to 25
10 to 19	Medium	25 to 50
20 or more	Heavy	50 to 100

Open Stands and Plantations (15 Feet in Height and Over)

In open growing red-pine stands 15 feet in height and over, 10 trees selected at random will constitute the sample. Because red pine is able to withstand complete defoliation for at least 2 seasons, twig examination will be made only on plots showing evidence of red-pine sawfly defoliation occurring during the past season. This defoliation is recognized by presence of current foliage on branches that do not possess older foliage. Absence of defoliation will be recorded on the survey sheet by placing an "X" in the last column.

When sawfly defoliation is encountered, twig examinations will be made. Because of the height of the trees in these stands it will be necessary to employ a pole pruner to collect specimens. Branches will be cut from the upper crown of each sample tree, attempting to select 4-year-old branches wherever possible. Five twigs having current foliage will be examined for sawfly eggs on each tree. Results of the examination will be recorded on the tally sheet and the data processed to yield a stand classification. Plots on which no defoliation was observed, and consequently recorded as "X" on the summary column, will be included and considered noninfested in the determination of stand classification.

Closed Stands and Plantations (15 Feet in Height and Over)

In closed red-pine stands and plantations 15 feet and over in height, 5 trees selected at random will constitute the sample plot. As in the open stands of this height, twig examination will be made only on plots showing evidence of red-pine sawfly defoliation during the past season. Plots on which no defoliation is encountered will be recorded by placing an "X" in the last column on the tally sheet.

When sawfly defoliation is encountered, twig examination will be made. Collection of twigs by pole pruner generally is not practical because of the height of the trees and the closed canopy. An extension ladder, admittedly cumbersome to use in the forest, may be required to collect twig samples from 4-year-old branches in the upper crown. Ten current twigs will be examined per tree and the data recorded and processed to yield a stand classification.

Control Recommendations:

The red-pine sawfly consumes only old needles, i.e., needles other than those grown during the current season. This defoliation pattern occurs even though tender expanding new growth is present. Soon after sawfly defoliation is completed, elongation of current terminal growth reaches maximum expansion and the new needles are completely formed. Trees completely denuded of the old foliage reflect the defoliation in a reduction in annual increment. Tree mortality seldom occurs until severe defoliation has taken place for three successive seasons.

In consideration of the habits of the red-pine sawfly and the ability of red pine to survive its attack, control practices are not recommended during the first season of infestation. Unless aesthetic or special market use requires it, control will not be recommended on stands classified as "heavy" unless defoliation has been almost complete for two successive seasons.

Red-Pine Survey Procedure

Forest ____________ Ranger District ________ Plantation No. ________
Location T. ________ R. ________ Sec. ________ Quarter ____________
Acreage ________ Average Ht. _____ Natural ___ Plantation ___ Open ___ Closed ___
Date ____________ Observer ____________

Plot No.	Number of Current Twigs bearing Eggs										Total Twigs bearing Sawfly Eggs
	1	2	3	4	5	6	7	8	9	10	

Total Egg Bearing Twigs ____________
Av. No. " " " ____________
Stand Classification ____________

Summary of Insect Conditions in the Yaqui Valley, Sonora, Mexico

1960

Prepared by J. A. Sifuentes [1]
and W. R. Young [2]

The Yaqui Valley is located near Ciudad Obregón in the State of Sonora about 350 miles south of Nogales, Arizona. In this irrigated valley of 230,000 hectares, the hot, dry climate (average annual rainfall, 8 inches; average temperatures, maximum 110° F., mean 80° F., minimum 32° F.)[3] and the insect problems are similar to those in some additional 770,000 hectares of irrigated agricultural land in the river valleys of northwestern Mexico and certain areas of southwestern United States.

In this summary, the names of specialists who identified the insects are included for new reports this year. The specialists who identified the more commonly occurring species were included in last year's report (Cooperative Economic Insect Report, Vol. 10, No. 18, p. 343).

Cereal and Forage Insects: ENGLISH GRAIN APHID (Macrosiphum granarium) was present in wheat from January through April. In March, populations reached 25 per head, considerably less than in 1959. An APHID (Rhopalosiphum rufiabdominalis) appeared in January, infesting the roots and crowns of both wheat and barley. Infestations of 70-80 percent were common and averaged 4-9 aphids per plant. CORN LEAF APHID (Rhopalosiphum maidis) was present in barley from December, shortly after the plants germinated, until the heading stage in March and April. It was common to find fields with 100 percent infestation and an average infestation of 25 aphids per plant stem. SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) infested 60 percent of stalks in spring-planted corn. In fall plantings, this species caused stand losses of about 10 percent by feeding in the whorl of small plants. LEAFHOPPERS (Dalbulus spp.) reached population levels of 11 per plant in early planted spring corn. FALL ARMYWORM (Laphygma frugiperda) infested 75-90 percent of small corn plants in both spring and summer plantings. A THRIPS (Frankliniella occidentalis) reached levels of 95 per plant in small spring corn. Another THRIPS (Hercothrips phaseoli) caused injury to summer corn, 75 adults per plant; to soybeans in July and August, 300 nymphs per leaflet; to alfalfa in September, 17 adults per trifoliate leaf; and to beans in May and June, 17-32 adults per flower. CORN EARWORM (Heliothis zea) infested 40-50 percent of the ears in both spring- and summer-planted corn. SALT-MARSH CATERPILLAR (Estigmene acrea) invaded germinated corn fields in September, causing greatest injury in the field margins. Largest populations found were 38-42 larvae per 20-day-old corn plant. This species also defoliated soybeans in September, reducing yields by as much as 40 percent in some fields, and, in addition, caused some defoliation in sesame during the same month. A FLEA BEETLE (Chaetocnema sp.) was found in numbers up to 48 per small corn plant during September. An AGROMYZID and a FIELD CRICKET (Acheta sp.) were of minor importance on small soybeans during May. BEET ARMYWORM (Spodoptera exigua) defoliated young sesame plants during the spring months. Populations in some fields reached 7 larvae per yard of row. LEAFHOPPERS (Empoasca spp.) occurred in large numbers on spring-planted beans, causing severe foliage damage. PEA APHID (*Macrosiphum pisi*) infested alfalfa from November through March. SPOTTED ALFALFA APHID (*Therioaphis maculata*) reached population peaks of 80 per stem in March and 70 per stem in July. Yields of cuttings during these months were reduced 40-60 percent. CLOVER SEED CHALCID (*Bruchophagus gibbus*) (Det.by B. D. Burks) infested 65 percent of alfalfa seed pods during June.

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[1] Northwest Research Center, Office of Special Studies, S.A.G., Ciudad Obregon, Sonora, Mexico.

[2] Mexican Agricultural Program of The Rockefeller Foundation, Londres 40, Mexico 6, D.F., Mexico.

[3] Contreras Arias, A., 1942. Mapa de las Provincias climatológicas de la República Mexicana. Secretaría de Agricultura y Fomento, Institute Geográfico, Mexico.

Cotton Insects: CUTWORMS (*Agrotis malefida*, *A. ipsilon*, *Peridroma saucia*, *Chorizagrotis inconcinna*, *Didugua argentilinea*) (Det. by E. L. Todd) infested an estimated 30,000 acres of germinating cotton from February through April, when it was common to find 10-20 larvae per yard of row. In many fields it was necessary to replant after cutworm damage. A THRIPS (*Frankliniella occidentalis*) caused some foliage injury to seedling plants during the spring months. BOLLWORMS (*Heliothis virescens* and *H. zea*), serious pests this year, were observed to have two population peaks, infesting up to 30 percent of terminals in May and up to 58 percent in July. CABBAGE LOOPER (*Trichoplusia ni*) destroyed considerable foliage during July and August, when it was possible to find as many as 13 larvae per plant. A FLEAHOPPER (*Psallus* sp.) was generally distributed in the Valley from May through September and caused some fall of squares. A PLANT BUG (*Lygus* sp.) attacked squares from May through July, when 18 adults per 100 sweeps were common. A COTTON STAINER (*Dysdercus maurus*) appeared in May, and by June it was common to find general infestations of 300 adults per 100 sweeps. Considerable fall of squares and small bolls resulted from feeding by this insect. BEET ARMYWORM (*Spodoptera exigua*) caused important damage during July, feeding on leaves, flower bracts, flowers and small bolls. Infestations in some fields were 100 percent of plants, with an average of 1-4 larvae per plant. A BOLL WEEVIL (*Anthonomus* sp.) caused severe damage in the western part of the Valley where, during June and July, samples averaged 18-48 percent injured squares. In this area, yield losses of 30 percent resulted. Infestations of COTTON LEAF PERFORATOR (*Bucculatrix thurberiella*) and SALT-MARSH CATERPILLAR (*Estigmene acrea*) defoliated cotton during July and August shortly before harvest, but caused little yield reduction except in late-planted fields.

Vegetable Insects: PEA APHID (*Macrosiphum pisi*) was present on winter plantings of peas from January through March, and CABBAGE LOOPER (*Trichoplusia ni*) caused some defoliation in these same plantings. CUTWORMS (unidentified) reduced stands of lima beans planted in January and March. GREEN PEACH APHID (*Myzus persicae*) was present on peppers during March and April, and caused severe injury to this crop in the nearby Valley of Guaymas. A PEPPER WEEVIL (*Anthonomus* sp.) was also common in this neighboring valley.

Beneficial Insects: In a continued survey of natural enemies of the major pests, the following parasites were observed: BRACONIDS - *Aphidius testaceipes* from *Rhopalosiphum maidis* and *Trioxys utilis* from *Therioaphis maculata*; a PTEROMALID (*Heterolaccus grandis*) from *Anthonomus* sp. (in cotton); an ENCYRTID (*Copidosoma truncatellum*) from *Trichoplusia ni*; and TACHINIDS (*Gymnocarcelia ricinorum*, *Exorista* sp., *Eucelatoria armigera*) (Det. by C. W. Sabrosky) from *Estigmene acrea* and *Heliothis* spp. Predators observed principally in cotton, wheat, alfalfa and barley fields were COCCINELLIDS (*Hippodamia convergens*, *Coleomegilla maculata*, *Scymnus loewi* (Det. by E. A. Chapin), *Olla abdominalis* and *Cycloneda sanguinea*); NABIDS (*Nabis capsiformis*, *N. roseipennis* and *N. ferus*); REDUVIIDS (*Zelus laevicollis* and *Sinea confusa*); an ANTHOCORID (*Orius insidiosus*) (Det. by P. D. Ashlock); a MALACHIID (*Collops femoratus*); a CHRYSOPID (*Chrysopa* sp., *plorabunda* group) (Det. by S. Parfin); LYGAEIDS (*Geocoris* spp.); and several species of syrphid flies.

Summary of Insect Conditions - 1960

(continued from page 220)

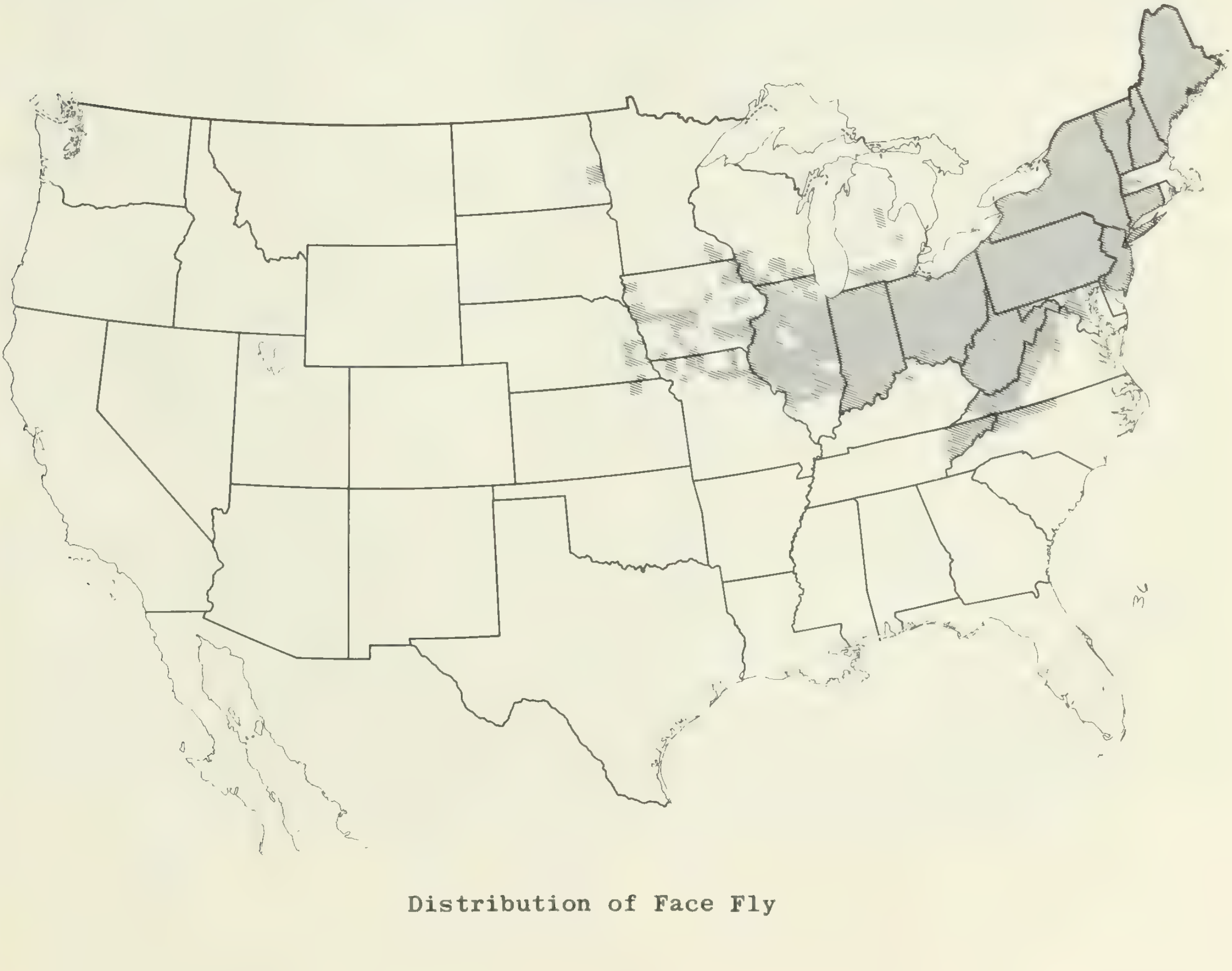
INSECTS AFFECTING MAN AND ANIMALS

FACE FLY (Musca autumnalis) became more widespread and abundant during 1960. The pest was recorded in CONNECTICUT, IOWA, KANSAS, KENTUCKY, MARYLAND, MINNESOTA, MISSOURI, NEBRASKA, NORTH CAROLINA, NORTH DAKOTA and TENNESSEE for the first time during 1960. It is now known to occur in all of the New England States except RHODE ISLAND. Populations increased considerably in some areas during 1960. In CONNECTICUT and VERMONT, populations were relatively high and face fly is now considered a potentially serious pest in the former State. The pest began appearing on cattle in Penobscot County, MAINE, by June 25, when counts were about one per animal, but increased to 100 flies per animal by July 25. Face fly was less numerous than in 1959 in NEW HAMPSHIRE, although it was present in all of the State; but, in PENNSYLVANIA, the pest was a severe problem, particularly in the western area. It lowered milk production in dairy animals and prevented normal gains in beef animals in that area of the State. Populations in northeastern Pennsylvania were less acute than in 1959, and in DELAWARE face fly was apparently not as abundant. However, the species was rather troublesome in houses in late April in New Castle County, Delaware. Populations in WEST VIRGINIA were considered heavy and general over the State, and they were abundant on beef and dairy animals in central MARYLAND. Face fly distribution in VIRGINIA was mostly restricted to the mountainous regions, where it caused considerable irritation to livestock. It was also reported as being a nuisance in homes, along with cluster fly (Pollenia rudis) in Highland and Pulaski Counties, Virginia. In NORTH CAROLINA, infestations were first found in the mountains where they spread downward faster than they did eastward into the Piedmont. In mid-July, the heaviest infestations were found near the Virginia State line in Ashe County, and by late summer heavy infestations had spread as far south as the northern edge of Avery County. In TENNESSEE, face fly infestations were found during 1960 in the eastern one-third of the State.

Face fly has now replaced house fly (Musca domestica) as the most important fly to the livestock industry in INDIANA. Populations in the northern half of the State built up to a high level in late June and remained high throughout the season. Counts were as high as 65 percent per cattle face; an increase in number beyond 65 resulted in their appearance on cattle backs, with counts up to 200 per animal. This fly is presently restricted in its habitat to about the northern half of Indiana. In MICHIGAN, face fly populations did not reach their 1959 levels, but the pest was the most important insect on animals in that State. The fly was first observed in ILLINOIS in 1960 on pasture in week of May 1, at which time populations varied from zero to 5 per animal. Populations continued at approximately this level throughout May and most of June in Illinois. The week of June 26, populations averaged 3.4 per animal in the central area, and by the week of July 10 they averaged 7 per animal in the northern half of the State. Populations increased rapidly during late July and early August, reaching 20-129 (averaging 40) per animal in the northern half of Illinois the week of August 14. Counts of 20-129 per animal continued until cool weather caused them to leave the cattle. A distribution survey in southern Illinois the week of August 21 showed 15 new counties infested. They were as follows: Schuyler, Brown, Scott, Jersey, Macoupin, Madison, St. Clair, Clinton, Piatt, Fayette, Effingham, Marion, Clay, Richland and Lawrence. None could be found at this time in Wabash, Edwards, Wayne, Saline and White Counties. A second survey in Wabash, Edwards and Wayne Counties the week of September 11 was also negative for face fly. The highest population in northern Illinois was found the week of September 4, when an average of 53 per animal was observed.

Face fly was collected in IOWA for the first time in Louisa County on January 15, 1960. Later in the year, 28 additional counties were found infested. Cattlemen in the eastern area of the State became very much concerned by the abundance of flies on heads of cattle in early July, and by October face fly was causing annoyance in houses quite generally. Face fly was collected for the first time in MISSOURI on June 29 in Marion County. Collections were made later in Knox, Scotland, Pike, Ralls, Macon, Linn, Grundy, Mercer, Harrison and Nodaway Counties. These counties are all in the northern half of Missouri. Average counts per animal on some dairy and beef cattle in Mercer County from August 26 to September 17 were as follows: August 26 - 11.9 on dairy cattle and 19.1 on beef cattle; September 10 - 38.8 on dairy cattle and 19.1 on beef cattle; September 17 - 4.3 on dairy cattle and 4.1 on beef cattle. The first face fly collection was made in KANSAS in Marshall County and collections were made for the first time in NEBRASKA on August 5 in Douglas, Lancaster and Saunders Counties, showing light to abundant numbers on cattle. Later, face fly was observed in some southeastern Nebraska counties.

Face fly was reported in Grant, Lafayette, Rock, Walworth, Vernon and Crawford Counties, WISCONSIN, for the first time in 1960. The first specimen of the season in Wisconsin was taken in Dane County on July 11. At least one reported incident indicates that face fly has been somewhat of a problem to many cattlemen in that State. In MINNESOTA, the fly was recorded for the first time in August. It is quite likely that this pest is widespread in at least the southern area of Minnesota, although it has been definitely identified from only 3 counties. Face fly adults were collected for the first time from shorthorn cattle during September near Fargo, NORTH DAKOTA.



Distribution of Face Fly

HOUSE FLY (Musca domestica) was abundant generally in PENNSYLVANIA and DELAWARE, and numbers were high around barns, eating establishments and many homes in MARYLAND during the summer, and extended well into the fall months. However, house fly was not as heavy as it was in 1959 in Delaware. The pest was common, but seldom economic, in VIRGINIA, and very prevalent around dairy barns in TENNESSEE. The outbreak of pink eye in cattle in Wilkes County, NORTH CAROLINA, in early summer, was not due to face fly, but primarily to lack of sanitation with regard to house fly. By late summer, beef herds in some areas of Watauga County, North Carolina, had to be housed indoors to get pink eye cleared so the veterinarians could certify the animals for sale. House fly was moderate to heavy in GEORGIA, about the same as in 1959 in ARKANSAS and numerous during the year in TEXAS.

House fly is now considered to be the second most important insect in dairy and beef herds in INDIANA, with face fly being rated the most important. Populations were normal throughout the summer, but increased to a rather heavy level in the fall in that State. There were sufficient numbers in WISCONSIN to be annoying in both barns and houses, although apparently more of a problem in barns; and the pest was considered a nuisance and persisted quite late into the fall in MINNESOTA. House fly populations were high in many localities of NORTH DAKOTA and abundant in the eastern area of SOUTH DAKOTA. The population of this pest became severe in an Omaha, NEBRASKA, stockyard area; and house fly was numerous in KANSAS, with more than the usual reports as a household pest being received in the late fall. In OKLAHOMA, house fly populations were generally low throughout the State during the first half of the year, but counts were considerably higher than normal in September and October. These high populations were so widespread in most areas of Oklahoma during this period that several cooperators commented that infestations were at the highest level noted in several years. The overall population during 1960 averaged somewhat higher than what was reported in 1959 in Oklahoma.

House fly was very numerous in UTAH, especially in the late summer and fall. It was considered above normal for the year in that State. In NEVADA, populations were moderate to severe as the season progressed and were above the 1959 level. Heavy house fly populations were a problem in all areas of ARIZONA during the late summer and fall, but were below normal generally in MONTANA.

HORN FLY (Haematobia irritans) was moderate to heavy in GEORGIA, worse than in 1959 in ARKANSAS, very abundant throughout LOUISIANA, prevalent over TENNESSEE, and a serious problem on dairy cattle in central MARYLAND. Infestations were also generally medium on cattle in WEST VIRGINIA. Horn fly was present in severe numbers on untreated cattle throughout northern INDIANA throughout the year. In the southern area of Indiana, when rain stopped, the populations dwindled quite rapidly. Counts of 600 per animal were recorded on untreated cattle during August in the central area of that State. In ILLINOIS, counts varied 0-20 per animal in the northern area and 0-100 per animal in the southern area the week of May 1. A peak was apparently reached the week of June 12, when 0-400 (average 127) per animal was observed. Later counts showed populations varying 0-250, but the average never went above 66 per animal. Horn fly populations were moderate to heavy throughout MISSOURI, with heavier infestations in the northeast, north central and west central areas. The pest was abundant in SOUTH DAKOTA, with Cottonwood Station reporting an average of 52 per head on cattle on June 28. Average counts of horn fly in NEBRASKA from June to October were 200 per animal in all parts of the State. The highest individual count in Nebraska was estimated at 2,000 on a Hereford bull in Franklin County. Populations in NORTH DAKOTA were high in many herds where control had not been attempted. Livestock producers who initiated treatment programs or provided self-treating devices for cattle kept infestations in check. No evidence of horn fly resistance has been reported in North Dakota.

Horn fly became active in OKLAHOMA during April in most areas and had reached a high level of infestation (75-1,000 per animal on mature cows and 3,000-4,000 per animal on bulls) on range cattle by mid-May. Peak populations were noted in most Oklahoma areas during mid-May and June and again in September. Counts made after mid-October averaged less than 50 per animal on range animals checked throughout the State. The overall infestation rate in Oklahoma was about the same as noted in 1959. Horn fly caused common and at least average annoyance to livestock in UTAH and was considered a serious problem statewide in NEVADA. Populations in NEW MEXICO were unusually heavy on livestock throughout the summer months, except in McKinley County, where counts were reported as being lighter than normal. Counts during August in New Mexico often ran over 1,000 per animal.

STABLE FLY (*Stomoxys calcitrans*) infestations were numerous all year in KANSAS and did not let up until frost. This was the reverse of other years when the heavy populations were seen in spring and summer. Infestations of this pest in OKLAHOMA began a gradual rise in early May and reached the year's peak (average 22 per animal) in early July in the north central area. Heavy populations, 8-14 per animal, continued in the north central area of Oklahoma until September and on until October in the southeast. Locally heavy populations were also noted during the summer months in the south central area. Stable fly was common in UTAH and caused at least average annoyance to livestock, and populations were high at many locations in NORTH DAKOTA. In NEBRASKA, populations of stable fly increased in August, causing bunching of cattle in feed lots in the eastern area. Populations in ILLINOIS averaged less than one per animal until late June when an average of 1.3 was observed. Highest populations were observed the week of July 10 in Illinois when an average of 7 per animal was found in the southern half of the State. Infestations in ARKANSAS were about the same as in 1959. In INDIANA, stable fly was a serious pest locally in barns and loafing sheds where straw bedding was not changed frequently. Preceding the late summer showers, this pest also caused considerable annoyance to humans in Indiana. Medium infestations were generally noted on cattle in WEST VIRGINIA and the pest was numerous at public beaches in southeastern Sussex County, DELAWARE, from late June through mid-July.

SCREW-WORM (*Callitroga hominivorax*) infestations were heavy throughout the year in TEXAS and medium to heavy activity was reported throughout the spring and summer in rangeland areas of ARIZONA. Scattered reports of infestations of *Callitroga* spp. were received from almost all areas of NEW MEXICO, but no unusually heavy infestations were reported. In KANSAS, several cases of myiasis were caused by screw-worm. One case of screw-worm in a greyhound dog in FLORIDA was traced to a Kansas infestation. Scattered cases of infested livestock occurred over OKLAHOMA in September, October and November. In LOUISIANA, a total of 215 infested animals was found in 1960 compared with 138 reported in 1959. The first case was reported in August. Infestations built up rapidly and began to taper off in November. Six parishes were involved in 1959 compared with 14 parishes in 1960. The heaviest infestations were reported from Franklin, Richland and Red River Parishes.

Maggots of a SARCOPHAGID (*Wohlfahrtia opaca*) sometimes attacked livestock in UTAH during 1960, but they caused very little economic loss to mink during the year. In 1959, mink growers suffered very heavy losses from this pest. FLESH FLIES were numerous in early summer and heavy populations were noted in heated buildings in the fall in KANSAS. BLOW FLIES were more numerous than usual about many communities in UTAH and were troublesome on livestock. They were also reported numerous in KANSAS.

SHEEP KED (*Melophagus ovinus*) was abundant and injurious generally in UTAH, especially during the winter, and on untreated lambs in the spring. Light infestations were general in WEST VIRGINIA and a heavily infested sheep was observed in South Kingstown, RHODE ISLAND, in mid-June. SHEEP MAGGOTS were light on sheep generally in WEST VIRGINIA and HEAD and WOOL MAGGOTS caused damage in UTAH.

SHEEP BOT FLY (Oestrus ovis) was a serious problem in sheep on the Navajo Indian Reservation, McKinley County, NEW MEXICO. Reports from other areas of the State indicate minor to heavy infestations were present. Infestations in WEST VIRGINIA were light to medium in sheep, generally.

RODENT BOTS (Cuterebra spp.) were more numerous during November in OKLAHOMA than noted in the past 2 years in wild rodents in the northern half of the State. Eggs of HORSE BOT FLIES were common on horses in Montgomery County, MARYLAND, in December; and bots were common and flies very annoying to horses in many localities of UTAH during the year.

A REINDEER WARBLE (Oedemagena tarandi) was widespread in most of the reindeer and caribou in ALASKA during 1960.

CATTLE GRUBS (Hypoderma spp.) caused normal damage as grubs and were annoying as adult heel flies in UTAH. New systemics were applied for grub control to more than 4,400 cattle in one area of Sanpete County during October of 1959. Control was excellent. Infestations were lower than in previous years in NEVADA. NORTHERN CATTLE GRUB (H. bovis) and COMMON CATTLE GRUB (H. lineatum) were once again the worst insect pests of cattle in WYOMING. Research on systemic insecticides and methods of application are being thoroughly studied for a more effective control of these pests. In ARIZONA, surveys during December 1959 showed a high percentage of untreated cattle were infested with common cattle grub in the central area. Counts from 44 head of cattle examined in Pinal County showed an average of 11.27 grubs per animal, with a high individual count of 43 grubs. In Yuma County, Arizona, 14 head examined averaged 1.6 grubs per animal, with a high individual count of 8 grubs. Common cattle grub was a problem on cattle throughout NEW MEXICO where cattle were not treated properly; but, infestations of this pest were about normal throughout the year in TEXAS. The overall common cattle grub infestation rate in OKLAHOMA continued on about the same level as it was in 1959. During January and February, the overall grub average on untreated mature range animals was about 15-35 per animal on comparable livestock. By late March, most grubs had pupated and some fly activity had begun. Egg laying continued in Oklahoma until early May in most areas, and grubs began appearing in light numbers in backs of cattle early in November. Counts gradually increased throughout the remainder of the year until, by late December, the average of all grub counts in Oklahoma reached 19 per animal in yearling steers. Common cattle grub infestations were comparable to those of 1959 in ARKANSAS and infestations were moderate in GEORGIA. Both common cattle grub and northern cattle grub continued to cause moderate losses to cattle in INDIANA; and both species were somewhat reduced in number in cattle in MARYLAND, light to medium in WEST VIRGINIA and moderately normal in TENNESSEE. Common cattle grub infestations occurred rather extensively in cattle in most northern CALIFORNIA counties. An unusual instance of a first-stage larva taken from the body of a two-year-old boy occurred in Tehama County.

TABANIDS were of minor importance on livestock on ALASKA, but were very annoying to swimmers. They caused a common and, at least average, annoyance to livestock in UTAH; and were unusually troublesome in many areas of WISCONSIN and constituted one of the prime insect concerns to dairymen. Tabanus spp. were locally a nuisance and caused considerable irritation to livestock in CALIFORNIA, and were very serious in many mountain meadows of WYOMING during the late summer, with counts in mountain meadows in the southwestern area in August being 7 per 10 sweeps. Tabanus spp. were less numerous than normal in KANSAS, but tabanids were more numerous than usual for the second straight year in OKLAHOMA. During the summer months in Oklahoma, counts averaged as high as 6-12 per animal in favorable areas in the eastern half of the State. Infestations dropped sharply to a low level, however, in the north central area of Oklahoma during September, but moderate numbers (1-5 per animal) persisted in the east central and southeast areas until October. The main species of tabanids involved during the year in Oklahoma were Tabanus sulcifrons, T. abactor, STRIPED HORSEFLY (T. lineola) and Chrysops spp. Tabanus spp. were heavy in some areas of ARKANSAS, but lighter generally than in 1959, and were very abundant in LOUISIANA and the coastal areas of TEXAS. Chrysops callida was also very numerous and became extremely annoying to man and animals in Louisiana.

Horse fly populations were moderate in MINNESOTA from mid-July to mid-August, mainly Tabanus sulcifrons, in the west central and southwest areas. Counts averaged 4 per animal. BLACK HORSE FLY (T. atratus) and T. sulcifrons were abundant in northeast INDIANA from the first week of August through the first week of September, but horse flies were relatively scarce in ILLINOIS. The number of "strikes" in Indiana was about 20 per minute, a severe infestation, but lower than that of the previous year. Tabanids were light to medium on cattle and horses generally in WEST VIRGINIA and not as troublesome to farm workers in the tidewater areas of MARYLAND as they were in 1959. In DELAWARE, Tabanus lasiophthalmus was fairly abundant in one area of Sussex County during late May and T. daeckei was rather abundant and annoying in eastern Sussex County in mid-June. In early July, T. nigrovittatus was very abundant in and around marsh areas throughout Delaware.

MOSQUITOES were again troublesome to man and animals in various areas of the Nation. In the East, the pests were very numerous in areas of MAINE which are usually free or lightly infested. This was probably due to heavier surface water in river and wood pools which remained in place much beyond the normal date, allowing maturation to take place. Aedes spp. predominated in Maine. In VERMONT, considerable annoyance from Aedes spp. was generally apparent, with some contribution from Culex and Anopheles types. Mosquitoes were about as troublesome as usual throughout NEW HAMPSHIRE until midsummer and more than usual breeding occurred in CONNECTICUT during the season, but because of the cool weather they were not unduly pestiferous. Mosquitoes were light on various hosts in WEST VIRGINIA and Aedes spp. numbers were reduced over 1959 in the salt-marsh areas of MARYLAND, although an outbreak occurred on the Eastern Shore of that State during August. Culex spp. increased in most sections of Maryland, and Psorophora confinnis, Aedes trivittatus, A. vexans and A. cantator were abundant and troublesome in sections of southern Maryland.

SALT-MARSH MOSQUITO (Aedes sollicitans) was again a major pest in Kent and Sussex Counties, DELAWARE. The greatest number of females collected in one night was 487 from the Dover light trap on July 25, a considerable reduction from the highest nightly catch of 3,684 from this trap in 1959. Season totals of salt-marsh mosquito from all traps, for 1960, are 20,000 less than those of 1959. Culex salinarius and Aedes vexans were abundant in the Wilmington area of Delaware and C. salinarius was especially abundant in June, July and August, with the highest nightly count, 916 females, occurring on July 25. A. vexans was not abundant during June and August, with a high of 113 females being recorded on June 24. Abundant precipitation during August and September caused the emergence of many rain pool and floodwater species such as A. atlanticus, A. canadensis, A. trivittatus, Psorophora confinnis, P. ciliata and P. ferox in Delaware. A. atlanticus, A. canadensis and P. ferox were troublesome in many of the woodland areas of Delaware during these months. Culex melanura was also collected but in light numbers. Another species, Aedes infirmatus, was collected for the first time in Delaware in 1960.

Many species of misquitoes were reported attacking man in NORTH CAROLINA, among them the uncommon Psorophora howardii. Biting by salt-marsh mosquito continued unabated in 1960. They were especially bad in the fall, and residents along brackish areas were unable to venture out even in midday with repellents. Aedes sticticus appeared in large numbers along the Tar and Roanoke Rivers following flooding in April. Mosquitoes were very numerous in LOUISIANA and became extremely annoying to man and animals. Several species of mosquitoes were also extremely heavy in certain areas of TEXAS, and they were extremely heavy during the last part of the season in KANSAS. This was the fourth consecutive year of mosquito outbreaks in NEBRASKA, being most noticeable in the eastern third of the State. Population buildups were late due to climatic conditions, although annoyance was reported in mid-April. The dominant species were Aedes vexans and Culiseta inornata. Mosquitoes were also very annoying in the eastern area of SOUTH DAKOTA in April and June. In MINNESOTA, 2 very heavy broods occurred in

Anoka, Dakota, Hennepin, Ramsey, Scott and Washington Counties. The first peak, which came on June 18, resulted from heavy rain in late May. The second peak occurred September 10 as a result of rain during the period of August 25-28 which averaged from 2-3.5 times normal and ranged from 5-8.7 inches for the three-day period. A. vexans was the major pest species. Scattered reports from various points in Minnesota indicate the mosquito populations were about normal. Mosquitoes, primarily A. vexans and A. dorsalis, were the principal pests of man and dairy cows in WISCONSIN. Heavy, spring rains favored oviposition and larval survival. NORTHERN HOUSE MOSQUITO (Culex pipiens pipiens) became noticeable the first week of August, and by mid-August, Culex salinarius became troublesome in Wisconsin. Mosquitoes continued to annoy and bite throughout the season and were even noticeable on warm days following frost. Aedes trivittatus, A. vexans and C. pipiens pipiens were the major pest mosquitoes in IOWA during 1960.

Mosquitoes were troublesome in the spring and early summer in UTAH, but less generally than normal in organized mosquito abatement districts. Populations in NEVADA were at about the same level as in 1959, which was the lowest in 3 years, except in irrigated areas where they remained severe pests. Psorophora confinnis was found in small numbers in the northeastern area of Clark County; the first record of this species in Nevada.

Mosquito populations in CALIFORNIA were comparatively low during 1960 as indicated by local mosquito abatement districts. The buildup was of lesser magnitude than during the past few years. Occurrence was recorded as numbers of females per trap night and data were compared with the median results for the years 1955-1959. All areas in the State, with the exception of the southern area, exhibited below-median levels the greater part of the year. Catches of Culex tarsalis were compiled separately. Two areas reported occurrences below the five-year median for a considerable part of the season: the Sacramento Valley area below median for 15 weeks, San Joaquin Valley area below median for 24 weeks; in the coastal and southern areas, the catches were below the median about half the time. Summaries emphasize C. tarsalis, but many other mosquito species occurred in the State. A survey of mountain mosquitoes was made from April to August in the high Sierras at elevations of 4,400 to 10,300 feet from the Yuba Pass in Sierra County to Luther Pass in El Dorado County. Aedes communis, A. ventrovittis and A. hexodontus appeared to be the most important pest species occurring in this area. Mosquitoes were not as damaging to livestock as in 1959 in California. Late rains in the fall and winter brought female mosquitoes out of hibernation for short periods, which were a local nuisance for a few days at intervals.

BLACK FLIES were troublesome in parts of Box Elder, Cache, Salt Lake, Uintah and other farm areas of UTAH and in several higher mountain localities during the fall hunting and fishing seasons in that State. An outbreak of Simulium arcticum occurred near Sunburst, MONTANA, which caused considerable annoyance, and Simulium spp. were abundant and very annoying in the eastern area of SOUTH DAKOTA during June. Black flies were about as troublesome as usual throughout NEW HAMPSHIRE until midsummer, and Simulium spp. were reported very heavy in most areas of MAINE by mid-May and continued heavy throughout the season. In DELAWARE, several species of black flies were collected by various persons during the years 1951 to 1959, and were recorded in the literature by D. W. S. Sutherland and R. F. Darsie during 1960 as being new records for the State. They were as follows: Prosimulium magnum, Simulium aureum, S. jenningsi, S. tuberosum, S. venustum, S. verecundum and S. vittatum. In NORTH CAROLINA, Prosimulium sp., hirtipes group, was recorded as biting man.

BITING MIDGES were troublesome in affected localities of Tooele, Salt Lake, Box Elder, Millard, Garfield, Juab and other counties in UTAH for a 2-5 week period. They were light generally on various hosts in WEST VIRGINIA and Culicoides obsoletus was recorded biting man in NORTH CAROLINA. In DELAWARE, Culicoides spp. were especially annoying in 1960 during early June in some areas of eastern Kent County and southern Sussex County. In CALIFORNIA, a BITING MIDGE (Leptoconops torrens) occurred in medium populations in San Mateo and Sacramento Counties from May to mid-July. This insect has increased considerably since 1959 in the State. Results are based on trapping and field observations in the mosquito abatement district.

A SNIPE FLY (Symphoromyia hirta) annoyed man and cattle in many canyons of UTAH, especially the northern area; and LAKE MIDGES (Tendipes spp.) were unusually heavy in areas along Lake Michigan in WISCONSIN during 1960. Several SAND FLIES, Phlebotomus vexator, P. californicus, P. oppidanus and Phlebotomus n. sp., were collected in the Columbia Wildlife Refuge of Grant County, WASHINGTON. Determinations of the sand flies were made by G. B. Fairchild.

Populations of an EYE GNAT (Hippelates collusor) were slightly above the 1959 level in NEVADA and much more prevalent in the spring and fall months. Heavy populations of this pest were a serious problem on the Yuma-mesa of Yuma County, ARIZONA, from May through November, with the heaviest concentrations occurring in and around citrus groves. In CALIFORNIA, H. collusor and H. robertsoni were the common species of Hippelates that occurred in many locations over the State and were a considerable problem to both humans and livestock. Many areas that were not previously bothered by gnats experienced infestations. In WEST VIRGINIA, an unspecified EYE GNAT was light to heavy on various hosts, generally.

YELLOW JACKETS were unusually abundant in 1960 in DELAWARE and created considerable annoyance to people in many areas of the State. The highest populations were usually associated with heavy aphid infestations in trees around homes in Delaware. In RHODE ISLAND, numerous complaints of yellow jackets came from schools where pupils were stung during play periods.

Injury by URTICATING CATERPILLARS surpassed all previous year's records in NORTH CAROLINA. The principal species involved were Megalopyge sp., probably opercularis. Others included SADDLEBACK CATERPILLAR (Sibine stimulea), Euclea chloris and Norape cretata. In VIRGINIA, several species of urticating caterpillars were reported from various localities of the State. Reports indicate that some cases required medical attention. The most common species encountered in Virginia were PUSS CATERPILLAR (Megalopyge opercularis), CRINKLED FLANNEL MOTH (M. crispata), S. stimulea and N. cretata.

FLEAS (Ctenocephalides spp.) were reported numerous times on pets and in homes from all parts of PENNSYLVANIA and medium to heavy infestations were present on dogs generally in WEST VIRGINIA. Adult flea infestations in homes and yards were severe in many local situations in June, July and August in RHODE ISLAND; and reports in CONNECTICUT indicated that fleas were abundant locally both indoors and out-of-doors in the late summer. Fleas were common in VIRGINIA, but seldom of economic importance, and were a nuisance in scattered localities over TENNESSEE. In GEORGIA, infestations were heavy in homes in Macon County; and flea populations were numerous in KANSAS, with many reports of homes being infested. CAT FLEA (C. felis) was abundant on dogs and annoying in some homes in New Castle County, DELAWARE, during June; and the flea heavily infested homes in INDIANA, with some difficulty in control being experienced except where organic phosphates were used. Severe cat flea populations were encountered in buildings in North Platte, NEBRASKA. HUMAN FLEA (Pulex irritans) was found indoors biting people in Kent County, DELAWARE, during the first of June. In CALIFORNIA, the flea problem was much reduced generally over the State from 1959, when they occurred in heavy populations. Cat flea occurred locally in homes and yards in the State as did DOG FLEA (C. canis), but cat flea was probably the most common.

BED BUG (Cimex lectularius) required control measures in a South Kingstown, RHODE ISLAND, poultry house, and a home infestation was observed in Pawtucket in late August. During midsummer, in NORTH CAROLINA, better than one infestation per week was treated by one exterminating company in a large city. Most infestations were traceable to certain areas of the city. Heavy bed bug infestation was detected in a house trailer in Blacksburg, VIRGINIA; this is the first report of this species in several years. The pest was also reported in homes in west central SOUTH DAKOTA and occasionally in UTAH. ASSASSIN BUGS and a BLOOD-SUCKING CONENOSE (Triatoma sp.) caused concern in homes in the southern and western areas of TEXAS, and Triatoma protracta and Rasahus thoracicus occasionally invaded residences to bite humans in CALIFORNIA. These latter species were not as numerous as in the past two years in California, however. Also in California, a MIRID (Psallus sp., probably vaccinicola) proved to be a nuisance early in the spring. Many residents, especially children, were bitten. Several swimmers were bitten in infested pools by BACKSWIMMERS in MONTANA.

CATTLE LICE caused their usual extensive damage to cattle throughout UTAH, with many herds being severely infested; and several species of lice attacked cattle in CALIFORNIA, with most infestations requiring control in the northern area. Infestations in NEVADA were slightly increased and were a problem on cattle during the spring, fall and winter months in NEW MEXICO. Haematopinus sp. was common on calves in barns during the winter in ALASKA and Solenopotes capillatus and other species of cattle lice were a serious problem in many WYOMING herds. Cattle lice in this latter State have been controlled effectively in some herds by systemic insects, and in other herds surface active materials have been effective. Heavy infestations of several species were common from January until late spring in OKLAHOMA in many herds. Cattle lice populations during the following fall rapidly reached the high level mark in all areas of Oklahoma, making the yearly infestation rate considerably higher than those of the past years. Cattle lice infestations in ARKANSAS were rather heavy in the spring, with several infestations similar to those in 1959; and infestations were light to medium on cattle generally in WEST VIRGINIA. In MARYLAND, lice, particularly Haematopinus eurysternus and Linognathus vituli, were noted on young bulls at Friendship, Howard County, during January. Cattle lice infestations in TENNESSEE were few and scattered over the State, but increased as winter appeared.

HORSE BITING LOUSE (Bovicola equi) was identified from ponies at Riverdale, Prince Georges County, MARYLAND; and HUMAN LOUSE (Pediculus humanus) was recorded in NORTH CAROLINA (the first record in 7 years). DOG LICE were light on dogs generally in WEST VIRGINIA. HOG LOUSE (Haematopinus suis) were numerous, but caused no alarm, in KANSAS; and light infestations were present on hogs generally in WEST VIRGINIA. LICE were also common on hogs and poultry in UTAH and were a problem on some poultry on farms in northwest PENNSYLVANIA. In CALIFORNIA, BIRD LICE were generally widespread within the State.

BROWN DOG TICK (Rhipicephalus sanguineus) was reported infesting many households throughout CONNECTICUT in the late summer and fall, and adults carried by dogs caused heavy infestations inside homes in several areas of RHODE ISLAND. Numerous reports were also received of infestations in homes in MARYLAND, and the pest was the subject of fairly regular inquiries since early July in INDIANA. Brown dog tick was very abundant in many wooded areas of LOUISIANA and infestations were heavy in south central TEXAS. Populations were about the same in OKLAHOMA as those recorded in 1959. The pest continues to be numerous each year in KANSAS and is now a serious dog and household pest. Brown dog tick infestations in NEVADA were heavy in one area of Washoe County and the pest was a problem around homes in most areas of ARIZONA throughout the year. In CALIFORNIA, the tick occurred on dogs, and in many cases on humans, in several locations in the State. In previous years, reports of this tick were quite infrequent.

AMERICAN DOG TICK (Dermacentor variabilis) was unusually troublesome in RHODE ISLAND from mid-April until July. A northward spread of the species in the State was indicated by its presence in Esmond and Lincoln this year. The pest was locally troublesome in a few recreational areas in NEW HAMPSHIRE and was reported as the heaviest ever observed in the Oxford-Otisfield area of MAINE. American dog tick was also common in the Yarmouth area and light in homes in Portland and West Scarboro in Cumberland County, Maine. The tick attacked humans at both Oxford-Otisfield and Yarmouth. In VERMONT, American dog tick was reported on a youngster in Jamaica, Windham County.

American dog tick increased considerably in most sections of MARYLAND and was more numerous than in 1959 in DELAWARE, being particularly troublesome on dogs during late April and May in the latter State. Infestations were apparently less numerous than in 1959 in INDIANA and WISCONSIN, but the pest was reported throughout the season from the northern area of Wisconsin. Populations of American dog rick were reported very heavy in the northern wooded sections of MINNESOTA in late May and June and many reports were received from the Twin City area of that State. The tick was also abundant in eastern SOUTH DAKOTA and high populations were reported in central MISSOURI during June, being higher in this area of Missouri than they have been for the past 8 to 10 years. Infestations in OKLAHOMA were heavier in 1960 than during 1959 in the central, north central and northeastern areas.

WINTER TICK (Dermacentor albipictus) was found on horses, cattle and deer throughout eastern OKLAHOMA in about the same numbers as those recorded in 1959. EAR TICK (Otobius megnini) infested a herd of native cattle in Shannon County, SOUTH DAKOTA, all season and caused local damage to cattle, sheep and sometimes pets, in several UTAH counties. SHEEP TICKS were a problem on some farms in northwest PENNSYLVANIA during 1960.

LONE STAR TICK (Amblyomma americanum) populations were heavier in the summer of 1960 in OKLAHOMA than those recorded during the same period in 1959. As in the past, the eastern half of Oklahoma was the heaviest hit. Infestations of this species averaged 6 per animal on beef cattle in southwest and south central MISSOURI in mid-May, and the pest was very abundant in many wooded areas of LOUISIANA.

RED TICK (Rhipicephalus evertsi evertsi) was collected for the first time in the United States in an animal compound ("Africa U.S.A.") at Boca Raton, Palm Beach County, FLORIDA, during the fall of 1960. An infestation was also found at Tampa, Hillsborough County, in a similar compound, but all of the infested animals were treated and the infestation is believed eradicated at this location.

DOG TICKS were numerous in southeastern PENNSYLVANIA and TICKS were light to heavy on various hosts generally in WEST VIRGINIA. In MAINE, Ixodes muris was found in Orono in September (believed to be a new record for the State) and I. cookei was reported attacking humans in Cape Nedick area. Unspecified TICK infestations were heavy on dogs and on beef cattle locally in GEORGIA; more severe in 1960 in ARKANSAS; and populations and infestations were up over 1959 throughout NEVADA.

Several species of TICKS were reported in areas of CALIFORNIA, generally being probably more numerous in 1960 than they had been in the past few years. PACIFIC COAST TICK (Dermacentor occidentalis) occurred numerous times on humans and dogs, usually associated with hunting and vacation camping; and a TICK (Ixodes pacificus) occurred on humans in different parts of the State. CATTLE TICKS were generally light on California cattle, occurring particularly in the northern mountain pastures.

TROPICAL RAT MITE (Ornithonyssus bacoti) attacked a family and another woman in Wayne County, NORTH CAROLINA. The latter was under attack for about 6 months. Tropical rat mite was widespread in human dwellings in CALIFORNIA, contrary to previous years when the occurrence of this mite was rare in the State. HARVEST MITES caused severe irritation to men bagging bromegrass seed in Lincoln County, NEBRASKA.

NORTHERN FOWL MITE (Ornithonyssus sylviarum) was recorded for the first time in ARKANSAS during 1960 in Washington County, and several cases of seriously infested chickens were observed during the fall in southern RHODE ISLAND. In CALIFORNIA, northern fowl mite affected the poultry production considerably, causing loss of vigor and egg production. Poultry in San Diego County was particularly affected. There were also several instances where the mite invaded homes and offices in California and annoyed people.

CHICKEN MITE (Dermanyssus gallinae) was abundant locally in poultry houses in South Kingstown, RHODE ISLAND, during the summer; and the pest was common on several flocks in the Matanuska Valley of ALASKA. POULTRY MITES were common in UTAH.

A total of 35 DOG FOLLICLE MITE (Demodex canis) infestations were reported by the State Veterinarian from January through November in NORTH CAROLINA, and MANGE MITES and EAR MITES were light on dogs generally in WEST VIRGINIA.

CHIGGERS were very abundant in many wooded areas of LOUISIANA and have become pests of turkeys on ranges in ARKANSAS. In CALIFORNIA, a CHIGGER (Trombicula belkini) was reported to have been the source of annoyance to several families and their pets in Oakland, Alameda County, during August. Also in California, ANGLEWORM MITES (Uropoda agitans and Tyroglyphus sp.) occurred in fishworm beds in many locations; sometimes singly and sometimes both species. The control of this mite problem has been difficult without damaging the earthworms.

BLACK WIDOW SPIDER (Latrodectus mactans) was reported locally in Walworth and Hughes Counties, SOUTH DAKOTA; in a small urban area of southeastern PENNSYLVANIA; and was frequently found about, or occasionally in homes and farm buildings, in UTAH, especially in the fall. One or 2 persons were reportedly bitten during October in Utah. A BROWN SPIDER (Loxosceles reclusa) was recorded for the first time in NEBRASKA in Richardson County.

SCORPIONS caused above-normal complaints in NEVADA.

Additional Notes from California: PIGEON FLY (Pseudolynchia canariensis) occurred in pigeon lofts as medium to heavy infestations in several widely separated locations within the State. This pest was probably more prevalent this year than in past years. BLACK BLOW FLY (Phormia regina) and a SHEEP MAGGOT (Phaenicia sericata) both were pests of sheep and HORN FLY (Haematobia irritans) required control in Amador County. HOUSE FLY (Musca domestica) and LITTLE HOUSE FLY (Fannia canicularis) populations were generally low over the State. Local medium to heavy populations occurred in problem areas, but were not continuous. The fungus, Entomophthora muscae, was active, but not to the extent it was in 1959 when it effectively reduced fly populations. SHEEP BOT FLY (Oestrus ovis) - A case of ophthalmomyiasis was reported from Avalon, Catalina Island, in June. First-instar larvae were taken from the eye of a patient.

HOUSEHOLD INSECTS

A number of pests were troublesome to homeowners in 1960. Among those most often mentioned were cockroaches, termites, flies, earwigs, boxelder bug and clover mite. In addition, dermestids, field crickets, elm leaf beetle, ants, various weevils and millipedes were troublesome in certain areas.

PAVEMENT ANT (*Tetramorium caespitum*) was a common pest in RHODE ISLAND, with specimens observed most frequently in early April. BLACK CARPENTER ANT (*Camponotus pennsylvanicus*) was more prevalent than in recent years in VERMONT and another CARPENTER ANT (*Camponotus* sp.) was very annoying in rough lumber structures in the Matanuska Valley of ALASKA. In MARYLAND, PHARAOH ANT (*Monomorium pharaonis*), *Lasius interjectus* and pavement ant caused considerable annoyance to homeowners throughout the year. ARGENTINE ANT (*Iridomyrmex humilis*) winged forms appeared in June in the radius of one city block in Oakland, CALIFORNIA, causing considerable annoyance to motorists and homeowners.

COCKROACHES were reported throughout the season from homes in SOUTH DAKOTA; not uncommon in homes in MONTANA; and were pestiferous around homes in OREGON. GERMAN COCKROACH (*Blattella germanica*), ORIENTAL COCKROACH (*Blatta orientalis*), BROWN-BANDED COCKROACH (*Supella supellectilium*) and occasionally AMERICAN COCKROACH (*Periplaneta americana*) or others infested many commercial establishments and various homes, apartments, motels, etc., in UTAH. In CALIFORNIA, oriental cockroach and brown-banded cockroach are the most common species reported as household invaders. They usually occur separately, but occasionally mixed populations will occur. The brown-banded cockroach has become a common household pest within the past 3 years in California. Prior to this time, it was of unusual occurrence and very locally restricted. Oriental cockroach was a common problem in RHODE ISLAND, particularly in the Providence area; and the pest was unusually common in Davis County, UTAH, homes, with many new homes also being infested. It was also reported from several new homes in the northern area of DELAWARE.

German cockroach was common in ALASKA urban areas. A large number of telephone calls indicated that populations of this pest were heavy in the Lincoln area of NEBRASKA. German cockroach was reported to be increasing in numbers and importance due to resistance to chlorinated hydrocarbons in INDIANA. Numerous instances of resistance to phosphates compound the problem in 1960 and seem to indicate that it will continue to be the number one pest in this category in the State. German cockroach was troublesome in homes over MARYLAND and was a pest in several areas of VIRGINIA. Brown-banded cockroach is increasing in the Thirteenth Naval District in WASHINGTON, and was pestiferous in homes and spreading more in distribution each year in OREGON. In WYOMING, this cockroach is increasing in numbers in many areas of the State, being especially numerous in housing areas in Cheyenne, Laramie, Casper and Rock Springs. Infestations continued to be a problem in areas of New Castle County, DELAWARE; and the pest was troublesome throughout MARYLAND and in several areas of VIRGINIA. Brown-banded cockroach is definitely becoming more numerous in NEW HAMPSHIRE, particularly in the larger urban areas; and the cockroach infested a Cranston, RHODE ISLAND, home in early April.

FIELD CRICKETS were very abundant and annoying in basements of homes in SOUTH DAKOTA and NORTH DAKOTA. Populations built up to nuisance levels around homes and businesses in eastern NEBRASKA, and were unusually abundant in INDIANA due to the favorable climatic conditions. From time to time they appeared by the hundreds on sidewalks outside houses and stores in the latter State. Field crickets were of no serious consequence in RHODE ISLAND in 1960.

SUBTERRANEAN TERMITES were the most important structural wood pests in VIRGINIA and were reported many times in PENNSYLVANIA and TENNESSEE. Inquiries concerning these pests were numerous during the swarming season in INDIANA and were less numerous, but regular, since that time. The trend toward increased interest in pretreatment noted in 1959 has continued in Indiana. Subterranean termites again damaged many homes and other buildings throughout UTAH, with losses increasing each year. EASTERN SUBTERRANEAN TERMITE (Reticulitermes flavipes) caused considerable concern and losses to homeowners in MARYLAND, and it remains the number one pest in this group of insects in DELAWARE. Infestations reported in the latter State in homes, especially in New Castle County, were more numerous in 1960 than in 1959 and very large swarms were noted in several areas during mid-June. Winged forms were occasionally observed in February and March in RHODE ISLAND, with the most numerous flights being observed in early April in most areas of the State. WESTERN SUBTERRANEAN TERMITE (R. hesperus) was pestiferous in homes in OREGON, and infestations occurred in Lewis and Clark, Powder River and Prairie Counties, MONTANA. A DAMPWOOD TERMITE (Zootermopsis angusticollis) was also pestiferous in OREGON homes.

WASPS and HORNETS were household pests in UTAH,and began causing concern when they moved out of hibernation in early April in RHODE ISLAND. They continued to be a problem throughout the season in Rhode Island, with most complaints regarding hornet nests being received in mid-August. BEES and WASPS were a problem during July in Fargo, NORTH DAKOTA; and WASPS (Polistes spp.) were more common than usual in most areas of OKLAHOMA during the latter part of the year. Adults caused considerable concern in many Oklahoma communities as they began entering major buildings seeking winter quarters. GIANT HORNET (Vespa crabro germana) was a pest around homes in several areas of VIRGINIA during 1960.

FACE FLY (Musca autumnalis), in combination with CLUSTER FLY (Pollenia rudis), was a pest in homes in areas of VIRGINIA and PENNSYLVANIA. Face fly was also a household pest in MAINE late in the year. Farm homes in IOWA were commonly infested by face fly during October, with several reports of large numbers in homes in towns. In INDIANA, face fly has become a serious threat as a household pest. Fall invasion of rural and suburban houses became a fact this past fall, with several homes having thousands congregating in attics and upstairs rooms. In one home in Warren County, thousands of these pests, apparently seeking an overwintering locality, entered the attic, window frames and rooms. In suburban houses in Indiana, counts have been consistently high, 30 to 40 per day, during the fall. In UTAH, cluster fly invaded many homes in the fall; and HOUSE FLY (Musca domestica) was all too common in establishments handling food.

Collections of VINEGAR FLIES were made in CALIFORNIA from February to December, with a concentrated effort during July, August and September. The preponderance of collections was made in the San Joaquin and Sacramento Valleys. Cooperating agencies made separate surveys. In addition to ruining fruit, the flies were a great nuisance value and interfered with harvest and processing. The survey disclosed that Drosophila melanogaster was the predominant species, and other species of importance were D. simulans, D. hydei and D. pseudoobscura. D. simulans was observed in considerably smaller numbers in 1960 than in 1959.

CARPET BEETLES were pestiferous around homes in OREGON, especially VARIED CARPET BEETLE (Anthrenus verbasci); and CARPET BEETLE (A. scrophulariae) was a household pest in UTAH. Carpet beetles were reported numerous times in NORTH DAKOTA and PENNSYLVANIA, especially BLACK CARPET BEETLE (Attagenus piceus) in the latter State. Black carpet beetle and FURNITURE CARPET BEETLE (Anthrenus flavipes) were of considerable concern in MARYLAND and were the carpet beetles most often reported in that State. Black carpet beetle was more prevalent than in recent years in VERMONT.

DERMESTIDS were common and occurred in all areas of MONTANA. HIDE BEETLE (Dermestes maculatus) became troublesome in a meat processing plant in Pawtucket, RHODE ISLAND, in early July; and LARDER BEETLE (Dermestes lardarius) was more prevalent than in recent years in VERMONT.

HAIRY SPIDER BEETLE (Ptinus villiger) caused concern in a Pascoag, RHODE ISLAND, home; occurring occasionally in all rooms in the house.

Unspecified EARWIGS were numerous in homes in southern LOUISIANA and infestations of an EARWIG (Labidura riparia) were heavy, and reported from several areas of GEORGIA. EUROPEAN EARWIG (Forficula auricularia) and L. riparia both were present in CALIFORNIA. European earwig was not the nuisance value it has been in former years in that State. In areas where water coolers are used, earwigs are still a pest; where the electric cooler has replaced these, the problem has disappeared. Most reports in California were dooryard infestations, with an occasional house invasion. L. riparia occurs in the southern end of California and is extending its range, while European earwig is of general occurrence in northern California. European earwig invaded many schoolrooms and homes, causing annoyance, in UTAH, and was about normal in NEVADA. Populations of this earwig were much less troublesome in NEW HAMPSHIRE than in 1959, and European earwig adults were most prevalent in RHODE ISLAND in early July, although not unusually abundant. RING-LEGGED EARWIG (Euborellia annulipes) was reported entering homes and business establishments in annoying numbers for the first time in several years in OKLAHOMA. These reports were received from several communities in the south central and southwest areas in late December.

ELM LEAF BEETLE (Galerucella xanthomelaena) was a pest around homes in several areas of VIRGINIA; seeking hibernation places in most cases. In INDIANA, the pest appeared in houses from early February until mid-June due to emergence of hibernating adults. Although populations seemed normal during the summer, there were also a few complaints during the fall.

STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus) adult migrations into homes were reported in UTAH and in many areas of NORTH DAKOTA, and were pestiferous in homes, along with BLACK VINE WEEVIL (B. sulcatus) and Trachyphloeus bifoveolatus in OREGON. Adults of a JAPANESE WEEVIL (Calomycterus setarius) became abundant and caused great concern, entering homes in the Cranston area of RHODE ISLAND in early July and August. ASIATIC OAK WEEVIL (Cyrtepistomus castaneus) was reported from numerous localities of VIRGINIA as being a general nuisance in homes, motels and similar places after being attracted to lights. A large number of new counties was reported infested for the first time. Adults of an unspecified CARABID became extremely numerous, entering homes in South Kingstown and Narragansett, RHODE ISLAND, in late July and early August. SAP BEETLES (Glischrochilus spp.) have been particularly troublesome as uninvited guests when cooking is done out-of-doors in INDIANA. If the present trend toward "outdoor living" continues, these insects may well become one of our most troublesome pests in Indiana.

POWDER-POST BEETLES have become more prevalent than in recent years in VERMONT, and were the second most important structural wood pest during 1960 in VIRGINIA. Many old, advanced infestations of powder-post beetles were regularly observed in all areas of RHODE ISLAND. They were also reported from several places in SOUTH DAKOTA. OLD-HOUSE BORER (Hylotrupes bajulus) infestations were numerous in homes in MARYLAND and reported locally in VIRGINIA. Activity of this pest was observed in August and November in RHODE ISLAND where it is known to be of regular concern. Adults and larvae of CADELLE (Tenebroides mauritanicus) were reported damaging woodwork in homes in Davison County, SOUTH DAKOTA.

BOXELDER BUG (Leptocoris trivittatus) was a nuisance to homeowners during the spring in RHODE ISLAND, MARYLAND and DELAWARE, and during the year in VIRGINIA and TENNESSEE. It was also very annoying in late October in Delaware. In NEBRASKA, boxelder bug populations were very high in the eastern half of the State and isolated areas of the sandhills, which created many telephone calls asking for control recommendations from residents. The pest was also more of a household pest than normal in KANSAS, and it invaded many schoolrooms and homes in UTAH, causing annoyance.

FALSE CHINCH BUG (Nysius ericae) nymphs invaded a number of homes in Salt Lake and Utah Counties, UTAH; and a GRASS BUG (Arhyssus barberi) was pestiferous around homes in OREGON. Several country schools were infested by SWALLOW BUG (Oeciacus vicarius) in MONTANA. Unspecified APHIDS caused concern in RHODE ISLAND by overrunning foundations and entering homes from overpopulated willows in the Pawtucket area in mid-August.

CLOTHES MOTHS were a household pest in UTAH,and Tineola sp. was more abundant than in any previous year in ALASKA.

Larvae of a CASEBEARER (Coleophora sp.) were very numerous on a porch of a home at Bountiful, Davis County, UTAH, during September; apparently an unusual record. Also in Utah, a PSYCHID (Apterona crenulella) again infested the outside of a few northern area homes. Larvae of a PYRALID (Aglossa caprealis) were fairly common, infesting woolens in a home in Newark, DELAWARE, during early October.

SILVERFISH (Lepisma saccharina) was a household pest in UTAH, reported in 2 homes in VIRGINIA, heavily infested several DELAWARE homes during the spring and was of concern to homeowners in all sections of MARYLAND.

CLOVER MITE (Bryobia praetiosa) was locally troublesome in RHODE ISLAND, entering homes in the spring and fall. Invasions of this pest were rather common in DELAWARE from mid-January until mid-May, and the mite was a nuisance around homes in MARYLAND, PENNSYLVANIA, VIRGINIA and TENNESSEE at various times. Clover mite adults were also reported as a nuisance to residents in Lincoln, NEBRASKA, during April and November and it invaded many homes and schoolrooms in UTAH, causing annoyance. Populations in NEVADA were slightly higher than in 1959, and they were pestiferous around homes in OREGON. The normal occurrence of this mite invading dwellings in CALIFORNIA was higher in 1960. This is possibly due to new subdivisions. In ALASKA, clover mite was annoying in a number of households, especially in the Anchorage area.

CENTIPEDES were of considerable concern to homeowners in all sections of MARYLAND and HOUSE CENTIPEDE (Scutigera coleoptrata) caused concern, running across floors of homes in the Narragansett area of RHODE ISLAND in late May.

MILLIPEDES were more troublesome than in 1959 in DELAWARE, especially during the fall season, when these unwelcomed visitors were rather numerous in many homes in northern New Castle County. They were also of considerable concern to homeowners in all sections of MARYLAND; and heavy invasion of basements and garages by an unspecified species occurred in the Newport area of RHODE ISLAND in mid-July. These pests defied control measures and became a serious local problem in that State. In NEBRASKA, residents in the eastern area reported that many millipedes were invading homes and sheltered areas in early October.

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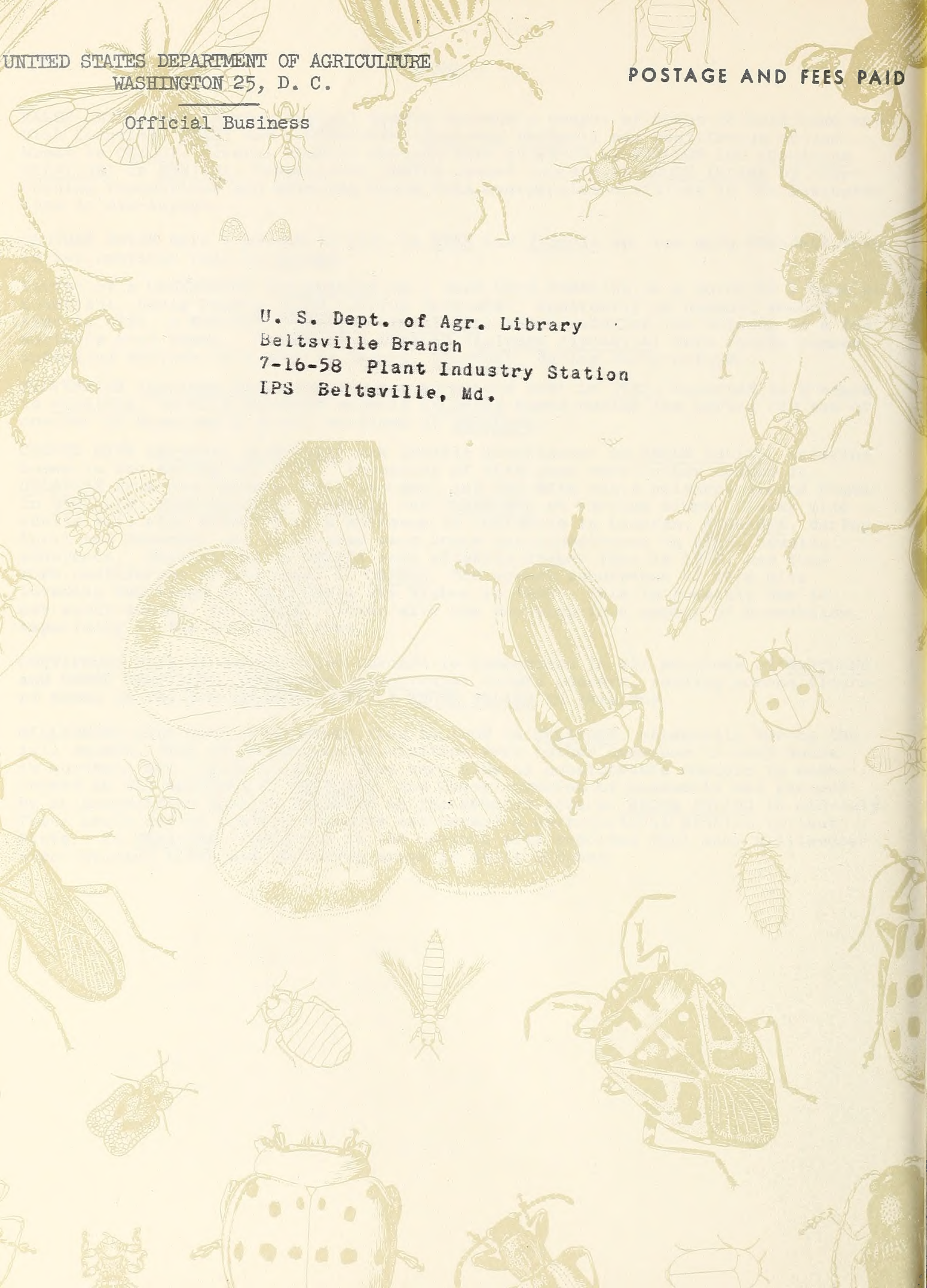

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